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STUDIES IN
THE HISTORY OF IDEAS

VOLUME III

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STUDIES IN
THE HISTORY OF IDEAS

EDITED BY
THE DEPARTMENT OF PHILOSOPHY
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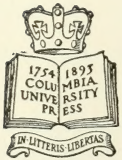

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AN EMPIRICAL SURVEY OF EMPIRICISMS

JOHN DEWEY

AN EMPIRICAL SURVEY OF EMPIRICISMS

JOHN DEWEY

THERE are three historic conceptions of experience. The first is that formulated in classic antiquity, which persisted well into the seventeenth century and, as far as time is concerned, is the most important and influential. The second is that characteristic of two centuries, the eighteenth and the nineteenth. Although it is more recent, it is what now generally comes to mind when the term empiricism is used. The third is the latest movement, still in process of development. In discussing them it will be well to forget about empiricists and to consider the various concepts of experience. For if we start with the "ism," there is danger of becoming involved, as most discussions of "isms" do, in a somewhat sterile dialectic; while the conceptions of experience behind the different forms of empiricism and the various controversies concerning them are at least attempts to interpret a definite subject matter.

The clue to the Greek conception of the nature and limitations of experience may be derived most easily and directly from a present use of the word "empirical," as in the saying that medicine for a long time was on a purely empirical basis and that for the most part the practitioners of medicine were empiricists. It is well illustrated in the story that James tells in his *Psychology* of the brakeman in the old-fashioned railway car. The car filled with smoke from the stove while the train was at the station, and when the passengers complained, the brakeman replied, "Well, it

will stop just as soon as the train starts." The man asked why, and the brakeman said, "It always does." That is a good illustration of the meaning of experience and the empirical as conceived from the Greek point of view. The great mass of weather prophecies, the bulk of information upon which the arts and crafts depend, medicine to some extent, blacksmithing, carpentering, shoemaking, etc., are examples of empirical knowledge. Putting it negatively, while "experience" supplied fairly dependable information, dependable for purposes of practical utility or of action, it did not involve or depend upon any insight into the cause or reason of the occurrence. That is essentially what we have to do with when we give, in general outline, a Greek philosopher's account of experience. It denotes the accumulated information of the past, not merely the individual's own past but the social past, transmitted through language and even more through apprenticeship in the various crafts, so far as this information was condensed in matter-of-fact generalizations about how to do certain things like building a house, making a statue, leading an army, or knowing what to expect under given circumstances.

With Plato, experience begins to get the depreciatory meaning which has clung to it all through the classic strain in philosophy. The reason for the derogatory view is, I think, fairly obvious. This kind of knowledge does stand in unfavorable contrast with knowledge that depends on insight as to why things happen, or on understanding the reason and the cause of things, for, on the whole, in earlier thought the terms "reason for a thing" and "cause of a thing" are largely synonymous. If you knew *why* a thing happened, then you understood it, you grasped the reason for its occurrence. Consequently, experience and empirical knowledge were set in very definite contrast with science,

since science meant, of course, understanding or rational comprehension. This difference was illustrated for Plato in the contrast between the knowledge a geometer built up in a systematic, rational way and the kind of generalizations a carpenter might use. Experience had all the limitations which custom has. Indeed, the whole concept of experience was closely connected with the idea of habit and custom, if not identical with it. It was a collective memory or funded deposit of the past, just like the brakeman's "The smoke will stop because it always has done so." The recurrent events of the past leave behind them a certain definite expectation that things will continue in that way. Consequently, experience cannot give rise to knowledge in the honorific sense of science, but only to opinion, and, although opinions may sometimes be correct, that occurs, so to speak, by accident, because there is no knowledge of why they are true.

In Aristotle we have a more systematic account of the nature of experience and the reason for giving it a low status in philosophy. It is well to recognize that for him experience is not sensation nor perception, but rather the funded, practical, organized information about things that has come by the accumulation of past experience and the sifting out of the successful elements in the past experience from the unsuccessful ones.

Aristotle has the idea—of course the idea came to him ultimately from Plato—of a stepladder in knowledge, a series of grades: first is sensation, then comes perception involving organization of sense qualities. Now to Aristotle there are forms even in sense, and even in perception we grasp forms rather than mere stuff or material, since we grasp characters, characteristics, features. To know a chair is to know a certain structure that defines a whole class of

objects; to perceive a thing as a chair is to grasp an element which therefore is, as far as it goes, general. Next in order comes the imagination. It preserves the formal element, the structural element, at the expense of matter. Our imagination, that is, our reproductive imagination or memory, while it does not grasp the form in its purity, lays hold of it with less immersion in sense or matter than is the case in direct sense perception. Now, by a kind of subconscious psychical mechanism which, like all of Aristotle's psychology, has its biological side, the images are preserved and more or less integrated with one another, the images that are similar, reinforcing one another. Thus we get an idea, a nonscientific idea but none the less an idea, of a *kind* of things, an empirical classification or generalization, and that is experience.

First sensation, then perception, then the reproductive memory or reproductive imagination, and then the consolidation or organization of these images in experience. And with this generalized idea there is also a general tendency to action in a certain direction toward a certain end form, in other words, a habit. As in the case of Plato, it is assumed that through language, through education, the cumulative process goes on in the arts and crafts not simply through the individual's life-time but also through successive generations. Thus experience comes to consist of standardized ways of action and a standardized body of beliefs, expectations, materials, and techniques.

Experience thus in both Plato and Aristotle, more on the whole in Aristotle than in Plato, serves the useful purpose of giving us the consolidated net results of past experience in the form that makes them available for further action. But there is also the same contrast, as in the case of Plato, between experience and science, understanding, or compre-

hension, which depend on reason. In fact, this contrast defines reason: whatever gives us forms entirely pure from matter is reason, the *intellectus purus* of scholastic and early modern philosophy. The chief way in which Aristotle modifies the Platonic concept of experience is in formulating this graded emerging of rational understanding out of experience.

There are certain things, according to Aristotle, concerning which empirical knowledge is the only kind possible. Where there is no necessity and universality in the objects and occurrences themselves, and where the element of contingency enters in, empirical knowledge is the only kind we can arrive at, though it is not the demonstrative knowledge which constitutes science. Thus social, political and moral matters are the kind of material in which universality and necessity do not exist; and, as Aristotle was wont to say, it is the mark of an educated person not to expect more exactness in the ideas about a subject matter than the subject matter itself permits of.

I might note in passing, though it is perhaps not strictly related to my subject, that this is one great difference between Plato and Aristotle, more important to my mind than many of the differences that have been emphasized. Plato was quite aware that political and social matters were not regulated by reason and did not have a rational and necessary form, but a large part of the problem for him was to consider under what conditions morals and politics might really become a science and lawmaking in the community be rationally regulated. Thus his *Republic* is an attempt at least to sketch ideally the conditions under which politics and morals might become truly rational. Aristotle had no such ambition. He was perfectly willing, I won't say to throw morals and politics to the dogs, but he was willing to leave

them to probability and opinion, to a certain amount of guesswork, especially to the intuition of the shrewd expert. Rational or scientific control is reserved for purely theoretical and intellectual matters. Thus Aristotle made a sharper distinction between matters of practice—even moral and political practice—and theory than Plato had done.

This is, I think, why Aristotle is conventionally treated as more empirical than Plato. Aristotle held that, historically and psychologically, reason can function only as the outcome of a series of graded steps up from sensation. For him there was no original, separate and independent rational intuition. The latter had to pass through the stage of experience so that even a scientist, dealing with demonstrable and rational matters, would, as a matter of his own development and education, need the preparation of an empirical stage. This dependence of rational insight upon experience is not in any way logical or epistemological. It is a biological and, one might say, a biographical and a pedagogical matter. There is no logical connection between arriving at a certain height and climbing a ladder, yet things are so constituted that under certain conditions we cannot get to a particular place unless we climb a ladder.

I wish to emphasize a point which is now rarely mentioned but is necessary to an understanding of Plato and Aristotle, namely, that the Greeks did not separate the cognitive or intellectual from the active in the way in which the separation has become current in modern thought largely through the influence of Immanuel Kant, who was not satisfied until he had separated, if he possibly could, everything that belonged together. I do not mean that the Greeks attempted to derive one from the other, but that they always saw them in pairs, so that different stages of activity corresponded directly and intimately to different stages of intellectual cognitive grasp. It is rather elementary in Platonic

and Aristotelian psychology that the connection of sense with appetite is much closer than it is with knowledge. If we begin with taste and smell, the connection with the appetite of hunger is obvious; but even in sight and hearing, the higher senses, the senses as such are essentially organs of biological activity connected with the appetite. You may remember the incident in Plato where he describes from a moral point of view the appetite of a man whose sense of decency was restraining him from viewing a corpse, but who finally opened his eyes wide and said, "There, take your fill." In other words, there was a hunger expressed through the eyes that had to be satisfied, just as there is in taste and smell. The imagination as memory corresponded to a *particular* line of action associated with the reproductive image of some form of experience. Custom and habit were the practical or active correspondents or correlates of empirical knowledge. And then, finally, the beholding with esthetic satisfaction of perfect forms, ideas or ideals, being pure intuition with Plato, or self-inclosed rational activity in the case of Aristotle, corresponded to the essentially divine activity, *theoria,* of pure reason.

The reason I am calling attention to this now is that, especially through the influence of Aristotle, experience is commonly limited to that form of activity ordinarily called "practice." We say, "That is practical," "That is a practical man," and we mean the kind of activity that is adapted to securing certain rather limited utilities—utilities rather than higher values. The supreme activity is that of the pure intellect, and therefore it must be distinguished from every kind of practical doing and making. Subsequent philosophy inherited this depreciation of "experience" as being connected with lower and practical activity in contrast with the superior worth of purely rational activity.

Experience was thus identified with action concerned

with material and limited utilities, as well as set in antithesis to science. Because of its limitation to "practice" in its restricted utilitarian sense, experience cannot rise above mundane things. The artisan, the typical exemplar of experience, is dependent upon his tools and his materials; his activity is therefore never wholly independent, free, liberal. But theoretical activity is carried on by reason within reason and thus is independent of all extraneous aids. Even moral and political activity is practical, and, since it requires the coöperation of others, is not self-contained as is pure thinking.

Here then are three great limitations of experience as it was conceived by classical philosophy. There is the contrast of empirical knowledge (strictly speaking, of belief and opinion rather than knowledge) with science. There is the restricted and dependent nature of practice in contrast with the free character of rational thought. And there is the metaphysical basis for these two defects of experience: the fact that sense and bodily action are confined to the realm of phenomena while reason in its inherent nature is akin to ultimate reality. The threefold contrast thus implies a metaphysical depreciation of experience, an epistemological one, and, coloring both of the others and giving them their human value, a moral one: the difference in worth between activity that is limited to the body and to physical things, originating in need and serving temporal utilities, and that which soars to ideal and eternal values.

Even when the concept of experience was greatly transformed in later thought, the stock criticism against the knowledge that is based on experience remained. No amount of experience can establish a universal and necessary truth. It cannot get beyond the general, *i.e.*, the usual and customary. Since reality was conceived to be immutable and eter-

nal, manifested in essences that make things to be necessarily what they are, empirical "knowledge" is limited to the changing and the contingent. Mathematics, for example, which is the only truly scientific element in the physical sciences themselves, is beyond its capacity. While Aristotle was content with the conclusions of experience in social morals and politics, since he regarded them as falling within the realm of the probable, with the advent of Christianity there was a demand for basing morals on absolute truth. So in this sphere also empiricism became suspect, because it could not provide universal and necessary truth.

In many respects, the account of experience given by Plato and Aristotle was, on its positive side, itself an honest empirical report. For the kind of experience which the ancient world had, and the medieval, too, until the rise of the new experimental science, was of the kind described. There was no technique by which a rational control of empirical observation and expectation could be brought about. There was no way, so far as I can see, of anticipating the fact that such a technique would ever come into existence. There was no way of seeing how rational thought could gain a leverage within experience, so that experience could be fruitful of new truths and capable of testing the beliefs to which it gave rise. The gap between experience and a rational ideal seemed fixed and impassible. Experience might grow quantitatively but it could not alter its quality.

In short, the account given of experience was a correct statement of the conditions of contemporary culture. The mistake involved in the philosophy of the period was in its assumption that the implications of a particular state of culture were eternal—a mistake that philosophers as well as others readily fall into. If the experience of the time had been the measure of all possible, all future, experience, I

do not see how this conception of the nature of experience could be attacked. But the significant point to be borne in mind (one that philosophers of the present period have little excuse for ignoring) is that subsequent developments show that experience is capable of incorporating rational control within itself.

In speaking of the second typical concept of experience, I shall make a long and abrupt jump and come to the ideas enunciated by John Locke, passing by, for lack of time, the important anticipations of thinkers prior to his date. I cannot, however, refrain from noting a radical shift in evaluation which marked Roger as well as Francis Bacon. Classical philosophy, as we have seen, identified experience with the beliefs and skills that were due to custom and consolidated memory, and regarded it as in consequence inevitably enslaved to the past. Thinkers began to put the shoe on the other foot. What had passed for rational truths seemed to them infected with stale repetition and blind acceptance of authority. In contrast "experience" suggested something fresh and personal, while "reason" signified dogmas and doctrines that owed their power to convention and tradition. It is interesting to note that this shift was accompanied by another, equally radical. Classical thought had glorified the universal and regarded the individual as valid only in the degree in which it was an organ of the universal. There was a growing tendency in the centuries preceding Locke to regard what had been considered as universal and objective as a kind of dead weight imposed upon men from without, and to regard the individual as the seat of freedom and the source of all advance, intellectual and political. This double reversal of valuation is perhaps more significant as an indication of the change taking place in culture than any one of the elements in the technical concept of experience.

John Locke was carrying further this new spirit when he defined experience as consisting essentially of observation, a view which implies that it is a direct, first-hand, personal contact with nature. Now observation proceeds through the senses. If, then, observation is made the test of the origin of valid knowledge, only "ideas" coming through the senses are to be trusted in physical matters. His faith in observation is the source of his hostility to innate ideas. His polemic against them, if carefully read, will show that his objection is not technical. Innate ideas, according to his reading of the times, had become the great bulwark of unfounded tradition and arbitrarily exercised authority. By definition they are not open to criticism and test. Say that a particular "principle" is innate and you have automatically exempted it from critical examination.

Locke held that a large part of so-called innate ideas, especially in the realm of morals, were in fact picked up from grandparents and nursemaids in early childhood, so early, indeed, that not being able to remember their origin we suppose they have always been in the mind, implanted in its very constitution. Locke's objection to what we now call the a priori was an objection against the imposed and the secondhand, and its motive is repeated in what he says about an undue dependence on uncritical reading of books. Its spirit is that of Montaigne and other "moderns." Like many things in all philosophers, his emphasis on observation and sensation can be understood only when we recall against what it was directed among the tendencies contemporary with him. His emphasis is a part of that spirit we call the Enlightenment—a movement which, manifested first in theological and then in political circles, is known as "rationalism"—so great are the turns that changes in culture bring about in terms.

What characterizes sensation and observation, and hence experience, is, in Locke's thought, their coerciveness. They are forced upon us whether we like them or not; if we open our eyes and ears we cannot help receiving certain "simple ideas." This coercion of will and of opinion is the essential guarantee of their validity—at least the only guarantee our constitution permits. Compulsion is the safeguard against vagaries of fancy and accidents of conventional belief. In contrast with this inescapable force, the ideas which we construct and label "rational" are our own constructions and hence suspect, unless we can check them by "experience" —that is, observation. For the latter, according to Locke, is something which nature, rather than mind, does. Hence his emphasis upon the blank tablet and passivity in reception of impressions.

Locke adhered to the classical tradition in holding that experience cannot supply universal knowledge, and drew the conclusion that there is no exact science of natural phenomena, but only probability sufficient for the conduct of life. The candle of understanding set up in us shines brightly enough to guide us on our path. On the other hand, he held that morals and mathematics may be true sciences, since, while the ideas with which they set out are derived from observation, *relations* between them are under our control, being made by mind, and hence do not have to agree with any external "archetype." They are their own models and originals and hence may be regulative of experience, being themselves patterns instead of having to conform to some other pattern. In other words, Locke himself was not the thoroughgoing empiricist of the sensationalist type he is sometimes represented to be. He recognized *relations* as essential to truly scientific knowledge and regarded them as the "workmanship of the understanding,"

although the elements that are related come from observation.

The next stage in the development of Locke's point of view was to reduce relations, as well as elements, to sensational form. Pleasures and pains were treated as kinds of sensation; and, according to the eighteenth-century French followers of Locke, attention, desire and volition can all be derived from suitable associations of sensation. To Locke himself, association had been a force by which objective or "natural" connections among things were supplanted by unnatural associations—such as jingles that sometimes haunt the mind and refuse to be expelled. To those who wrought his ideas out into a comprehensive logical system, association was the sole possible tie holding together sensations as elements of experience.

The system thus developed was adopted whole-heartedly in Great Britain by James Mill and his disciples. The system developed was so inclusive and so warmly espoused that its vogue has led many who ought to know better to regard associational sensationalism as the sole owner of the right to the name of a philosophy of experience. Some of them, while rejecting the philosophy, seem to go to the length of regarding it as an adequate account of experience as such. Indeed, Kant himself accepted it as an adequate description of what is empirical *in* experience, holding that for that very reason it had to be supplemented by a-priori factors if experience was to be coherent and cognitive.

This sensational philosophy, in its general outline, passed over into psychology and for a time had the prestige of being truly "scientific." It was, as Mr. Santayana has called it, a malicious psychology in its impact upon a mass of common-sense beliefs. But, taking the philosophy in its relation to the culture of its own day, it is necessary to see

what its malice was directed against, for in its own intention it was not aimed at science nor at common sense, but against various influential forms of superstitious dogmatism and arbitrary political authority. As far as science was concerned, it was taken for granted that science, freed from the oppression of these forces, would flourish and become the ruling principle of life. In this sense, this group of empiricists were indeed "rationalists" and of a radical character.

Their philosophy was intended to be, and was used as, an instrument of criticism for dissolving institutions then dominant, ecclesiastical and political. It used Locke's criterion to demand that all institutions produce the credentials of originating in experience by means of the action of nature upon us, forgetful that, according to the *conclusions* of their philosophy, "nature" had no longer any standing in court. Looking back, however, it is clear that this inconsistency in uniting nature with experience as the sole guarantee of validity rendered sensational empiricism a much more powerful tool of criticism and disintegration than would have been the skepticism which was its logical conclusion. Its power as a weapon was increased by the fact that it combined the force belonging to the idea of a natural order with that of fresh, unhampered personal experience.

On the positive side this empirical philosophy was used to magnify the importance, or according to Helvetius the omnipotence, of education. In connection with the coercive quality of observation, Locke had insisted on the passiveness, the receptiveness, of the mind. The world cannot stamp itself accurately on the mind if it does not have a blank on which to work. The French thinkers, starting from this idea of a passive, empty mind, virtually said (at least a few extremists did) that you can build up any type of

mind or character you wish by controlling the impressions, sensations, observations, of that mind, especially by controlling associations that are formed with pleasure and pain. The worst thing about bad institutions and all laws is that they corrupt minds. They associate happiness and success with the wrong kind of thing. A proper political and social order would associate sensations of pleasure with things that are socially useful, and of personal pain with things that are socially detrimental. It would be the business of education to further this action—an idea that was taken over not merely with regard to education but with regard to legislation and judicial procedures by Jeremy Bentham.

On the positive side, empiricism was thus an ideal, whether realized or not, associated with the eighteenth-century concept of progress and the opening up of vistas of the infinite perfectibility of humanity, when once the corruption that comes from bad institutions, political and ecclesiastical, had been done away with and education and rationality given a chance.

While then it had a definite intellectual basis in Locke, the typical empiricism of the eighteenth and the early nineteenth century is explicable as a social doctrine and a doctrine in which emphasis fell upon its use as a weapon. Therefore, because that phase is emphasized in all histories, I pass over the skeptical direction which Hume gave the earlier empirical doctrine, showing that, with the dialectic development of Locke's simple ideas, the result was complete skepticism as to the existence of an external world and a self. The truly empirical contribution of Hume lay in his revival of the concepts of habit and of custom and their importance. Of course the biology and the physiology of the time did not enable him to explain the importance of habit. It remained for him a simple and mysterious tie,

but he did introduce, even if through the back door, a principle of connection and of organization which undid the consequences of Locke's "simple ideas." But in any case the important thing, to my mind, in this empirical movement was its critical, negative side. Its power as a dissolvent of tradition and doctrine was much greater than any impetus it could give to construction. When the general cultural situation became such that a positive, constructive direction and impetus were required, there was the cultural opportunity for a new type of philosophy.

Thus we have the reaction of German philosophy of the nineteenth century, beginning with Kant and going through the whole romantic and neo-romantic period of German philosophy, later taken up in the England of the 1880's and '90's and becoming in the universities, the former centers of empirical or modified empirical philosophy, the dominant mode of thought. There was wanted some guarantee against the destructive, dissolvent tendency of empiricism carried to extremes. And the French Revolution served as a convenient symbol of what that philosophy would come to if it were allowed to go on unchecked.

I mention this rationalistic, spiritualistic reaction because it influenced so strongly some of the members of the empirical school, especially John Stuart Mill. Of course he was brought up in the strictest sect of empiricists by his father, James Mill, but through personal experiences, through social problems of the time, through the direct influence especially of Coleridge and Wordsworth, he felt the defects of historical empiricism and the need of something that would give a more stable, constructive ground for belief and conduct. He tried various devices to get it without giving up essentially his empiricism. Perhaps his most characteristic device was the invention of indissoluble

associations. What troubled him first was that if associations can build up a positive action, that also can be destroyed and the person left without any guide. And so he discovered, I think more likely he invented, a mechanism for creating association that could not be broken and that was so solid as to serve all the practical purposes of necessary and universal principles.

More important, however, in John Stuart Mill than his psychological experimentations, which were, logically, vagaries, was his interest in logic, in transferring the center of attention regarding experience from its psychological formulation to certain problems of scientific method. It is an easily ascertainable fact that Mill's interest in logic was primarily due to his interest in social, economic and political questions. His real problem was how the method used in the natural sciences could be employed in thinking about political and economic affairs so that they would be taken out of the field of mere opinion and prejudice.

His logic itself, almost anybody would admit, is an incoherent mixture of certain psychological premises derived from sensational association and a genuine interest in scientific method and scientific procedure on its own account. Indirectly rather than directly, I think it is fair to say (though I do not think the statement can be proved) that this change had a rather definite effect as an antecedent of and a stimulus to the development of the third concept of experience, which brings us down into recent times and into the present. It is a fact, or seems to be a fact, that the natural sciences, at least if for the sake of simplicity we leave mathematics out of account, depend upon experience. At the same time, it is unanswerable that if experience were what a sensational-associationist said it was, it could not possibly produce science. Therefore there is a mistake some-

where. Either natural sciences do not have the intimate dependence on experience that the enthusiasts on this subject think they have, or experience is a different sort of thing from what it had been analyzed as being either by the classic conception or by the eighteenth-century conception.

Moreover, there is a feature obviously present in the natural sciences which sensationalism does not explain or make possible, and this is experimentation. For all experiment involves regulated activity, directed by ideas, by thought. And in the present state of, say, physics, highly elaborate, intricate schemes of thought are here involved, beyond the reach of sense or of any form of observation. Therefore it would seem that those ideas which function as theories and hypotheses in scientific experimentation and organization are not copies of sensations nor suggested by past experience, by past observation, but that they have a free, imaginative quality that no direct sensation or observation can have.

Now, following this line of thought, one would deduce at least one phase of the philosophy of William James, namely, that validity is not a matter of origin nor of antecedents, but of consequents. This statement, associated with the philosophy of all pragmatism, is often treated as if it were directed merely against previous rationalisms. Its more direct objective of attack is previous empiricism. Mill, for example, following the empirical tradition, had said very definitely that all proof or demonstration of validity is a matter of the antecedents out of which an idea is constructed. And the whole point of James's philosophy, which comes out better in some chapters of his *Psychology,* I think, especially in the last chapter of the second volume, than in his lectures on *Pragmatism,* is that the value of ideas is independent of their origin, that it is a matter of

their outcome as they are used in directing new observation and new experiment. Therefore there is at least one factor in generating a new concept of experience and a new type of empiricism which cannot be understood when it is classified in terms of either of the two earlier historical systems. That is one difficulty with the history of philosophy. The tendency is to discourage originality, not directly, but by cultivating the temper of mind that believes every idea must be interpreted or understood in terms of some preëxisting system. It is obvious that if it is a good idea, I mean a really significant idea, it may involve a departure from any previously formulated system, and the criterion judging it must be worked out both by its critics and by those who have attained that idea.

The prevalence of experimental habits, looking ahead, looking forward, and using ideas, made one fundamental transformation in the concept of experience now in the process of developing. Another factor was the breakdown of the old introvert psychology and the development of a psychology having an objective basis, essentially a biological basis. It is impossible to get the same concept of sensation, to take one case, if sensations are approached from the biological and physiological side as was given by the old analytic psychology. In many respects we are getting much nearer Aristotle's psychology on this particular point in the approach to the problem. From the physiological standpoint it is quite obvious that sensations are part of the mechanisms of behavior and have a direct connection with the motor apparatus, and that they are stimuli to the outgoing patterns and remain their stimuli except when trained connections come into play, and that in that case, they become conscious sensations or sensory qualities. In other words, they have to do with the determination of new modes

of behavior, thus setting up internal relations through the tracks that will lead to a mode of action that had not existed before.

This third view of experience in the history of thought is still more or less inchoate, because it is still in process of development, but I have tried to call attention to two trends, or two motifs, that are influential in developing this newer type of interpretation of experience and therefore a new type of empiricism: namely, the practice of science, especially with reference to the use of ideas, hypotheses and experimentation, in the process of verification or validation through results; and secondly, the radically different psychological approach that comes from looking at things objectively, from the standpoint of biology rather than of introspective analysis.

GREEK GENIUS AND RACE MIXTURE

MATTHEW THOMPSON MCCLURE

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MATTHEW THOMPSON MCCLURE

Archeological research in the regions of the Ægean basin has been in progress for sixty years. It seems to me that the time has come when the student of Greek philosophy can no longer ignore the results of these researches. It is now possible to answer with a good deal of accuracy the question, Who were the Greeks? In this paper I propose to raise the question of the probable significance of an ethnological approach to Greek philosophy. I shall not attempt to demonstrate the thesis that the superior intellectual ability and versatility of the Greeks of the classical period are due to race mixture, although I believe this to be true; but I shall rather point to certain aspects of Greek thinking that seem to illustrate racial traits, and thus seek to indicate the possibility of race mixture as an explanatory hypothesis.

The study of the prehistory of the Greeks is beset with difficulties at every turn, but one fact stands out in undisputed clearness, namely, that the Greeks of the classical period were not a pure Aryan or Nordic race, but were a people of mixed descent. All three of the primary breeds of the white race—the Mediterranean, the Alpine-Armenoid, and the Northern—were commingled in the formation of the historical Greeks. Thus the statement of Zeller that the superior ability of the Greeks was due to the inherent quality of the Greek race is untenable. The Greeks were not a "race" at all.

Greek civilization emerged from an antecedent period

of obscurity and confusion. We now know that just as the culture of medieval Europe developed out of the remains of classical civilization after a dark age of upheaval, disintegration, and shifting of peoples, so Greek culture emerged from a similar dark age and was built on the ruins of its Cretan and Mycenæan antecedents. As in the formation of medieval Europe, the younger, virile, semibarbarous people of the north appropriated the superior culture of the classical past, so in the case of the Greeks, a warlike people of northern origin invaded and conquered an older and higher civilization of an entirely different ethnological constitution. There was one marked difference, however. Medieval culture developed under the authoritative influence of the Christian religion. The past was appropriated in an atmosphere of humility and deference. No such constraining influences were felt by the invading Greeks. The mingling of races and the cross-fertilization of cultures took place with savage naturalness.

It is now possible, I think, to assign racial traits to the different stocks that went into the making of the historical Greeks. The invading people from the north whom we may call Greeks, if for no other reason than that they imposed their language on the conquered people, were of Aryan or Nordic stock. They began moving into the Greek peninsula perhaps as early as 2000 B.C. By 1400 B.C. they seem to be in possession of the greater part of peninsular Greece. They were a moderately long-headed people and blond. These invaders brought with them no intellectual or artistic inheritance; what the original Greek possessed was a warlike spirit, a zest for adventure, and above all what Professor Oldfather has called "excessive nervous vitality." The story of their invasions and migrations is one of conquest and adventure.

The civilization which the Greeks displaced was composed of two racial stocks, one the Mediterranean, a people long-headed and brunet, the other Alpine-Armenoid, broad-headed and brunet. These native stocks were in possession of a high culture, they were gifted with a high degree of artistic genius. Art has always seemed to thrive in the Mediterranean basin. They were a peaceful people. Cnossus was a city without walls. An examination of their armor shows them to have been an unwarlike people. The Cretan, the Helladic, and the Cycladic cultures of the early and middle Bronze Age were a part of a wider Mediterranean culture that embraced the Nile Valley and the Anatolian coast. It is much nearer to the oriental than to Indo-European.

There is abundant evidence to establish the fact of race mixture. The invading Greeks intermarried with tribal peoples all along the route of their migratory path. The Mycenæan problem is of course the central problem in the prehistory of the Greeks. The prevailing consensus of opinion now is that the Mycenæan kings were Greeks. They were intruders who were installed in a foreign country. It is highly probable that the Mycenæan kings intermarried with the royal families at Cnossus. It is also highly probable that the Ionic-Attic represents the earliest group of Greek dialects to be intruded into the Ægean world. The Ionians were also the Greeks who mixed most with the native stocks. We are told by Herodotus that the Ionians who first settled Miletus did not even take their wives with them but married native Carian women after having killed all the men. In a thesis prepared under the direction of Professor Oldfather an examination was made of race mixtures among the Greeks, based on extant literary remains. One hundred and forty cases of race mixture falling within the historical period before Alexander, were culled from documents.

Among the Greeks of foreign blood are to be named Pittacus; Pythagoras; Melas, tyrant of Ephesus; Hipparchus; Themistocles; Miltiades; Cimon, the famous Athenian general; Thucydides; Pausanias, the victor of Platæa; Antisthenes the Cynic; and Demosthenes.

The significant thing is that in those regions where there was the greatest amount of race mixture, namely, in Attica, Ionia, and in a very small corner of northeastern Peloponnesus, there was the highest development of Greek genius. In the outlying regions where there was the least contact with the older culture, namely, northern and western Greece, and most of the Peloponnesus, there was no intellectual development at all. Thessaly, although Greek, contributed nothing, and in fact remained neolithic almost to classical times. Thrace, Macedonia, Illyria were invaded and inhabited by the same northern stock as Greece, but never achieved any intellectual or artistic distinction. The only area of the Peloponnesus that achieved a high culture was the northeastern corner including the cities of Argos, Corinth, and Sicyon. It is just this area where there was a considerable Ionian element in the population. The Dorians, the last of the invaders to enter the cradle land, preserved much of the old Nordic spirit. In Sparta the Dorians remained almost racially pure. True to the fighting spirit of their northern antecedents, the Dorians developed a highly perfected military régime, but little in the way of philosophy or art. The Dorians developed a civilization that gave the world a few kings, the Ionians a civilization that gave the world a few philosophers. Plato's philosopher-king is a hybrid figure. The warlike spirit is Dorian and ultimately pure Greek, the philosophic nature is Ionian and ultimately conditioned by race mixture.

Let us now turn to specific instances that seem to indicate the influence of race mixture in Greek thinking. Pericles in the funeral oration says of the Athenians: "We philosophize without becoming sappy." This balance between the cultivation of the mind and virility finds its best expression in the character of the "guardian" as depicted by Plato in the *Republic*. Plato's guardian is a mixture of a "great spirit" and a "gentle nature." Emphasis on the spirited element, its correlation with action and courage, insistence on vitality and a warlike spirit, are characteristic of that "nervous energy" which was taken to be the essential contribution of the original Greek. Emphasis on the philosophic nature, its correlation with leisure, contemplation, and science, is the result of the civilizing influence of cultural contacts. In the "guardian," therefore, we see the union of two contradictory racial ideals. Plato recognizes the origin of this dual character. "Take the quality of passion or spirit; it would be ridiculous to imagine that this quality, when found in the states, is not derived from the individuals who are supposed to possess it, e.g., the Thracians, Scythians, and in general the northern nations; and the same may be said of the love of knowledge, which is the special characteristic of our part of the world" (435e).

The education of the guardian in the *Republic* is designed to harmonize this dual strain in Greek character. "And as there are two principles of human nature, one the spirited and the other the philosophical, some God, as I should say, has given mankind two arts answering to them . . . in order that these two principles (like the strings of an instrument) may be relaxed or drawn tight until they are duly harmonized" (412). The two arts are, of course, gymnastics and music. "And he who mingles music with

gymnastics in the fairest proportion, and best attempers them to the soul, may be rightly called the true musician and harmonist'' (412a).

I think it is a plausible conjecture that the Greek emphasis on proportion and harmony as the ideals of character is due to the moral necessity of balancing two antagonistic strains in Greek personality. There would be no need of emphasis were there not danger. It is perhaps not too extravagant to conjecture that the doctrine of the mean in Greek ethics rests on the dual constitution of Greek character. Plato's ''two principles of human nature'' express two elemental racial survivals either of which if given free expression would lead to extremes.

There can be no doubt that musical education in the *Republic* is designed to soften and to civilize the spirited element in Greek nature. A similar view is later expressed by Polybius, who attributed the humanity and piety of the Arcadians to the fact that musical education was written into their constitution. He says: ''It was with a view of softening and tempering this natural ruggedness'' that they introduced music. He then adds:

> The people of Cynætha entirely neglected these things, although they needed them more than any one else; . . . and on the contrary gave their whole minds to mutual animosities and contentions. They in consequence became so brutalized that no Greek city has ever witnessed a longer series of the most atrocious crimes.

The civilizing influence of music brings up Plato's treatment of art. In general I believe that the Greek love of beauty and of art is essentially un-Greek and is to be explained as an inheritance from Minoan times. Certainly if we examine the geographical distribution of the decorative art of nascent Hellenism it will be found that the arts ap-

pear not at all in the regions dominated by Dorian and west Greek immigration, but chiefly in Attica, Bœotia, and Argolis, areas much less dominated by the invaders. I suspect that Plato's impatience with art, half approving and half disapproving, represents a struggle between two opposing racial ideals. The Minoan culture was highly artistic. The nearer we approach the Orient, the more we find art pursued for its own sake. The original Greeks were men of action and adventure, with little interest in art. Plato tolerated art but only in so far as it was moralistic or at most in so far as it was taken to be an embellishment of activity. I even suspect that the dualism of Plato, perhaps also the broader Greek dualism between action and contemplation, has some connection with ultimate racial differences. After all disinterestedness is an oriental ideal.

J. L. Myers has shown that Greek folk memory accords in a remarkable degree with historical fact. The Athenians believed themselves to have been aboriginal and, according to Herodotus, to have become Greek by adopting the Greek language and Greek customs. At all events it is certain that there was continuity of culture between the Athenian and the pre-Hellenic worlds. There is no Athenian whose physical features are better known than those of Socrates. These place him as distinctly non-Nordic. Socrates both in physical appearance and in moral philosophy belongs to the Mediterranean world. He is essentially un-Greek.

The Greek counter portrait to Socrates is seen in the character of Callicles as described in the *Gorgias*. The picture which Plato draws is that of an old Nordic viking. Callicles is a Greek of the period of the invasions. It should be remembered that Protagoras, the greatest of the Sophists, was geographically at least a Thracian. His philosophy is essentially a philosophy of action. Emphasis on individuality

and aggressiveness is typically northern. Absence of the contemplative spirit and impatience with science suggest remoteness from Ionian influence. The predatory views about justice look as if they were survivals of the times when the individual was forced to look out for himself.

The ancestry of Pythagoras affords some ground for speculation. The tradition arose in the Peripatetic school that Mnesarchus, the father of Pythagoras, was a Pelasgian merchant from Lemnos. It is now well known that the population of Lemnos was predominantly of unmixed Pelasgian blood and remained so until late historical times. If there is any basis in fact for this original Pelasgian strain in Pythagoras, it would afford some ground for the belief that the religious mysticism of Pythagoras was un-Greek. And if the case of Mnesarchus is at all typical it would seem that a considerable amount of non-Greek blood was coming into the islands of the southern and eastern Ægean, even during the seventh and the sixth centuries.

Nothing is known of the racial antecedents of Aristotle. Geographically he was, of course, a Macedonian. His wife, Pythias, was the sister or niece and the adopted daughter of Hermias, tyrant of Atarneus, who was said to have been a Bithynian barbarian. After the death of Plato, Aristotle spent three years at the court of Hermias. The attachment between the two men is well known. The high-minded man of the *Ethics* is another Nordic viking and may possibly embody Aristotle's conception of the vitalizing influence of savage contacts. It is, I think, more likely that the high-minded man is an idealization of the character of Themistocles whom Thucydides certainly and Aristotle probably admired greatly. An examination of the racial antecedents of Themistocles shows him to have been in part of foreign blood.

To account for the genius of a people is an exceedingly complicated undertaking. As yet we know almost nothing regarding the relative importance of heredity and environment, of race and culture. The multiplicity of formative factors, topographical, climatic, institutional, ideational, warns one against oversimplification. I have meant here merely to isolate the ethnological factor and to ask whether it has any bearing on the interpretation of Greek genius. Every application of the thesis may be incorrect. I am content if the thesis itself is worthy of consideration.

RENAISSANCE AND METHOD IN PHILOSOPHY

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I

History is, of all types of narrative and exposition, the least philosophical, since its design is the recounting of specific occurrences in their specific times and places. Yet for all the particularity and objectivity involved in that design, the means which the historian has at his disposal for its accomplishment introduce into history much the same philosophic problems as are to be found in the expositions of poets and scientists. Even more, when the history is of the evolution of ideas, the historian treats of the same issues as the philosopher; the philosopher canvassing past philosophers for supporting evidence and the historian grouping doctrines to trace the movements of thought are frequently indistinguishable. Much that has been written of the intellectual movements of the fourteenth and the sixteenth centuries, thus, in praise of the one and in blame of the other, no less than what has been written of the transition from the earlier to the later mode of thought, has been dialectic disguised as history, a debate between philosophers living some centuries apart. The historian assumes a different status from the men of whom he writes, chiefly in that he is of a later period, and the debate between him and his subjects has the peculiarity that the position of his opponents enters the debate only in the restatement he makes of it. He had need to be a philosopher as well as a historian, since even the restatement of a theory literally necessitates

abridgment, selection, omissions, particularly of arguments on which conclusions were based; and these devices involve sometimes subtle, frequently gross, modifications of the thought and intention of the original system.

Moreover, the study of intellectual history, of scientific, literary, religious, even political movements, turns directly upon the consequences that flow from philosophic oppositions. To be complete, a history must, whether by conscious intention or not, be the expression of a philosophy, suggested sometimes by the institution or age with which the history is concerned, adapted sometimes to the person of the historian or again to any of a number of possible exigencies of his career or intellectual concerns. In the past the historian has frequently been conscious of the theory his narrative exemplified, and it is not difficult to state the philosophy expressed by most of the classical historians. But in recent years the historian has directed his efforts rather more to minimizing than to recognizing and examining explicitly either the philosophic convictions which his narrative adumbrates or the manner in which those convictions determine the narrative itself. The tendency of modern philosophy to ape the sciences, to borrow its principles from the last fashion in science, has made it easy to become a philosopher without thinking of philosophy, for the difficulties have all passed into science, and philosophic solutions are accepted with scientific doctrines on the scientist's bare word. The positivistic attitude, which historians for the most part assume, requires only that they profess a tentative attitude toward theories, that is, that they share a current enthusiasm for science in which present and possible future theories are viewed tentatively, but past theories are considered incomplete or false. The consequence of the historian's attempt to model his method on the method of sci-

ence has been that, as in science, so in the line of historical developments no less than in the succession of histories, each stage seems an advance, in gross, beyond the preceding stage. Positivism in history has been philosophy disguised as objectivity and faithful adherence to facts. By it the historian is absolved from the need of an explicit examination of the philosophic principles involved in the works whose evolution he is tracing. The result has been that historians of science and philosophy looking back at the late Middle Ages seldom find, since they profess to write as historians, not as philosophers, more than a historic interest in the distinctions they repeat; yet that result has been predetermined by the fact that in their investigations they have been on the outlook for the most part for ideas and values, discounted in the Middle Ages, which were to assume importance later. The task of the historian, thus conceived, is usually the restatement of one doctrine in terms proper to another; his discovery of intellectual evolution and advance can, as frequently as not, be reduced to the discovery that it is impossible to arrive at a full or sympathetic understanding of those earlier doctrines in the later terms which he prefers. Consequently, for writers earlier than the day before yesterday, it has been praise enough to find that they anticipated something of the modern spirit or to say that they did as well as could be expected in a time when science and learning were so meager and superstition so strong.

The historian has shared in the general advance of science, acquiring new scientific instruments in the new techniques of modern scholarship and in the canons of scientific criticism which are as much of the modern period as the techniques of the other sciences. But in intellectual history he had been dogged by the paradoxes of philosophy: philosophers can adopt a new language without changing

their doctrines; they can continue to use the old language, even repeat the old principles, while they renovate their philosophic positions entirely; finally there are no two philosophic doctrines which a philosopher, even one engaged in the writing of history, cannot show to be the same or, if his intention should chance to be the opposite, different. The shifting interpretations and the long controversies in which scholars are involved on every major question of the intellectual complexion of ages are at bottom forms of those paradoxes. Consequently, as history has become more scientific, philosophic understanding of past philosophers has been on the wane. Modern critical editions of texts of the late Middle Ages and the Renaissance, with their scientific scrutiny of manuscripts and their carefully planned critical apparatus, frequently furnish texts worse than those of badly worked earlier editions in the important respect that the sense which was expressed clearly in the earlier edition has been missed and emended away in the later. Even more frequently, modern historical treatises, which have settled laborious problems of chronology, bibliography, authenticity, and which have completed the picture of the social, psychological and economic setting of the man and his works, distort and obscure the ideas and the distinctions expressed clearly by earlier critics who worked without the tools of modern scholarship, historiography and paleography. The problems involved in understanding and stating ideas have been lost in the increasing concern to clarify texts and to catch the spirit of times, with the result that texts have grown more obscure, and histories have come to repeat the monotonous story of widespread ignorance in all early ages contrasted always with the towering figure of some man, usually praised as the first modern man, or overthrown by some movement, usually called a renaissance. The question,

whether a given set of ideas is to be considered the corruption and disintegration of those of an earlier period, or whether it constitutes the reorganization, supplement, criticism by which the sounder doctrines of a later period are prepared, is one which is never far from the surface in a work which sets ideas beside ideas in a historical order. It is resolved, not by precision in working over documents, but by criteria which operate, usually surreptitiously, in the estimation of the utility and truth of ideas. Plato's conception of philosophy is in contradiction with that of Aristotle: to state the doctrine of either is a task of exposition, of philosophical history; to state their differences or their agreements is a task of pure philosophy.

If the historian is something of a philosopher, as well as a scholar, he must be disturbed by the recognition that his history is the reflection of two independent systems of ideas, his own and that of the men whose careers he is recording. The histories, thus, of the transition from the later Middle Ages to the Renaissance have themselves undergone an evolution in which the characteristics chosen and set down have reflected at each step the periods since the seventeenth century in which they were written. The logical extreme of objectivity would, of course, be the reproduction, in all details, of the age or the movements under consideration. Even more, by the criteria of scientific history, it would seem that only the contemporary of William of Ockham, John Buridan and Bishop Bradwardine could hope to know the force of the problems that agitated the fourteenth century. The paradox of history and the double play of philosophies in history can be stated even more baldly: to achieve objectivity William of Ockham is the only man who could hope to state the doctrines of Ockham, yet William of Ockham is the only man wholly unsuited to the task, for

any historian can show that Ockham's meaning is not what Ockham thought it to be and can muster psychological, economic and social criticisms by which it can be shown perspicuously to have been really the expression of something quite unsuspected by Ockham. The philosophic character of this debate, which is concealed in political and social histories, is most apparent in histories of philosophy. There, the very terms in which the history is traced have acquired modern meanings: the opposition between theology and science, between faith and reason, between realism and nominalism, authority, reason and experience as they figure in our histories of the fourteenth century, were discoveries of the nineteenth, not of the fourteenth century. Either of the extremes of contrary interpretations may therefore be imposed on the period with the full support of scholarship and the social sciences. The same arguments, the same shifts of interest, the same systematic readjustments in the fourteenth century have been described as degradations and misinterpretations of the philosophic positions of the thirteenth century, and with equal cogency as new insights into the inadequacies of the scholastic method, of the Aristotelian logic and physics in general, of the Augustinian attempt to turn all knowledge to the glory of God; and consistently with these recognitions, those same arguments have been made the potent statement of a criticism which was preparing for science before the beginnings of science. Economic, social, psychological reasons give force to each view in turn. On the one hand, the fourteenth century was a period of political and social unrest, of controversies between church and state, of the Babylonian captivity of the papacy, of heterodox popular movements in religion, of wars, and of the black plague: there were few men of

the intellectual ability to carry on the philosophic traditions of the thirteenth century and those men had neither the patience nor the leisure to undergo the long and tedious preparation which must precede expertness in philosophic discussions. Or, on the other hand, it was an age in which the new nationalism was arising, in which learning was being secularized, in which even the political and social unrest were signs of an intellectual ferment, in which the old was being undermined, and feudalism, canon law and dogmatic theology could already read their doom in the concern of physicists with nature, moralists with man, and merchants with commercial realities.

The tendency of philosophical theories to build historical facts, which, in one further step, are to be exploded as fictions, is not restricted to the histories of philosophic arguments. The interpretation of the Renaissance as a whole, its character and limits, the fact and manner of the intellectual rebirth, its differences from the Middle Ages which it named and criticized, its relation to the Reformation and the events which have followed since the sixteenth century, all betray history as disguised philosophy. Middle Ages, Renaissance and Reformation tend surprisingly to be the same and different. By most accounts it is easy to distinguish the characteristics of the Renaissance from those of the Middle Ages, but when those distinctions have been made, the Reformation tends to be assimilated to the Renaissance or to a reaction back to the Middle Ages; recently, however, the characteristics that had been taken to be marks of the Renaissance have been found earlier and earlier in the Middle Ages so that the sharpness of the distinction between the two periods has been breaking down, while scholars of the Reformation have been

finding traits in it of still greater innovations and still earlier traditions.[1] Erasmus and Luther both rejected scholastic theology and scholastic philosophy for a Christian philosophy, salubrious, without subtlety, intelligible to all. Yet to Erasmus, Luther was an enemy of letters, who stood in the way of a true interpretation of the Bible, in which the philosophy of Christ was to be found; to Luther the philological subtleties of Erasmus were as irrelevant to the true philosophy of Christianity as had been the philosophical subtleties of the Middle Ages. Both shared in the discovery

[1] "Like all great and complex movements, the Renaissance is capable of interpretation in various ways and from opposite standpoints. When we think of its importance in the preparation of our modern habit of mind, we are inclined to class it with the great epochs of advance, such as the Athenian Age and the Enlightenment. But if we take the testimony of its own writers we learn that its ideals were in the past, a restoration and not a progress. Its most enlightened champions appealed not to reason, but to the Roman poets; not to nature, but to classic authority. While the glorious freedom of thought attained by many of its representatives entitles it to be regarded as an insurgence of reason, its passionate rebellion against the rationalism of Aristotle and Aquinas forces us to consider it an artistic, emotional reaction against reason, like the Romantic Movement of the early nineteenth century.

"Nor is there any consensus of opinion as to the relations of the Renaissance and the Reformation. For long they were regarded as sisters, similar in origin and analogous in result; emancipations both, in different fields and with different emphases but with a friendly alliance, so that the elder sister prepared for the younger and the younger consummated the work of the elder. But of late it has been asserted that the Reformation was a reaction of backward minds against the Renaissance; the different points of view of the two have been stressed, and their rivalry and even hostility pointed out." Preserved Smith, *Erasmus, A Study of His Life, Ideals and Place in History.* New York, 1923, p. 1. Cf. R. H. Fife, "The Renaissance in a Changing World," in *The Germanic Review,* IX, No. 2 (April, 1934), 73-95; K. Burdach, *Reformation, Renaissance, Humanismus,* Berlin, 1926; A. Philippi, *Der Begriff der Renaissance,* Leipzig, 1912; for a discussion of the evolution of the concept, Renaissance, prior to Burckhardt, see W. Kaegi's Introduction to Burckhardt's, *Die Kultur der Renaissance in Italien,* in Jakob Burckhardt, "Gesamtausgabe," V, xxxiii ff.

which has been made the glory of their century, of man, nature, and letters. But naturalism had long been the possession of the Middle Ages[2] and writers of the twelfth century or even earlier had possessed virtually the whole of Latin literature, while the philosophers of the thirteenth century had the information to discuss the philosophic positions of the Greeks, even that of Plato, at least as intelligently from a philosophic point of view as did their successors in the sixteenth century.[3] Moreover, these new dis-

[2] For a discussion of medieval and renaissance naturalism together with a criticism of statements of the Renaissance, see Et. Gilson, "Le Moyen âge et le naturalisme antique," in *Archives d'histoire doctrinale et litteraire du moyen âge,* VII (1933), 5-37. The traditional view, on the other hand, would find in the conceptions of nature and man peculiar discoveries of the Renaissance. Cf., e.g., Harald Höffding, *A History of Modern Philosophy,* London, 1915, I, 9: "The meaning of the Renaissance, then, is that it denotes the period during which the limitations and one-sidedness of the mediaeval conception of life found themselves confronted with new experiences and new points of view. However different in kind may be the phenomena presented to us in the philosophy of the Renaissance, yet common to them all is a great enthusiasm for, and confidence in, Nature, and the effort to carry through a unifying conception of existence, and to assert the law-abidingness and authorization of natural human life. The Renaissance begins with the latter point—with the assertion of the rights of human nature—and afterwards leads to the development of a new conception of Nature, and to a new method of investigation."

[3] Cf. the many illuminating pages on Plato written by Aquinas in his commentaries on Aristotle. Thus in the commentary on the *De anima,* his version of the relation of the Platonic and Aristotelian conceptions of the soul is one from which modern commentators might learn that it is possible to write of Aristotle's refutation of his master, without supposing that one or the other of them was guilty of childish errors. Thus Aquinas states the rationale of his interpretation in *De anima,* I, lect. 8, ed. by A. M. Pirotti, Turin, 1925, sect. 107, p. 42: "Posita opinione Platonis, *hic Aristoteles reprobat eam.* Ubi notandum est, quod plerumque quando reprobat opiniones Platonis, non reprobat eas quantum ad intentionem Platonis, sed quantum ad sonum verborum ejus. Quod ideo facit, quia Plato habuit malum modum docendi. Omnia enim figurate dicit, et per symbola docet: intendens aliud per verba, quam sonent ipsa verba; sicut quod dixit animam esse circulum. Et ideo ne aliquis propter ipsa verba incidat in errorem, Aristoteles disputat contra eum quantum ad id quod verba ejus sonant."

coveries of Luther and Erasmus were made chiefly in the pages of the Bible, of Jerome and Augustine, while their contemporaries were making similar discoveries in the writings of Cicero, Seneca, the Pseudo-Dionysius the Areopagite, Plato and even Aristotle. The historian's judgment of the Renaissance has therefore been forced of late to greater subtleties: the Middle Ages possessed the letter but not the spirit of ancient literature and philosophy; the Renaissance secularized the humanities. As these distinctions are pursued, paradoxes multiply in our histories, and philosophic difficulties become more explicit. The freeing of learning from theology involved the affirmation of the individual and the discovery of man in his own right as a psychological entity. This new intellectual freedom had a liberalizing effect on morals and religion, which in turn reach their culmination in the Reformation, in Luther who denies free will in his philosophy, deprecates the importance of human works and considers the use of reason in the interpretation of the Bible or the elaboration of religion a fatal error and presumption. Moreover the new ethics and religion of the Renaissance are derived from the Bible, usually as seen through the eyes of Saint Augustine, notwithstanding that medieval morals had been derived from the same source. Again, that new ethics, although, like the old, it is directed toward salvation, is somehow part of a tradition that breaks with the supernatural theories of the past to find its foundation in the nature of man; the new religion is somehow to prepare for a natural religion, in harmony with the new ethical tendencies and based on the doctrine of the immanence of the divine in the world and in humanity. These humanistic tendencies, finally, notwithstanding the indifference of the humanists to the scientific developments of their age, were the consequences of a

grander conception of physical nature, which philosophy and the sciences were elaborating, and of the methods coming into use in the new sciences.

Even in a brief and extreme statement of characteristics that have emerged in the attempts to describe the activities of the Renaissance, what is striking is not so much the absurdity of any statement nor again its truth, but rather the circumstance, with which the philosopher can be more complacent than the historian, that none of the statements need be regarded as inconsistent with any of the others, that one does not face the alternative of affirming or denying one of two contraries, since the truth seems to be approximated more closely by the statement of both than by the choice between them. It can be shown that the sense of nature and of man was as pervasive and as deep in the Middle Ages as in the Renaissance, that the doctrines which were professed in the sixteenth century concerning the place of God relative to man and the cosmos, and the place of faith relative to reason, experience and authority were not without anticipations in the preceding thousand years; but the inference does not follow therefore that the two periods were the same in manner and in production. Erasmus did possess the classics in a manner in which Abailard did not, for he not only had read works which were inaccessible to Abailard, but he had read and interpreted differently those that they possessed in common. It is equally true, therefore, that he possessed the Bible too in a different manner from Abailard, for his method of interpreting is as radically different from the method of Abailard in the case of the Bible as in that of any other work. But, to change the manner of reading Aristotle, Vergil, Moses and Paul is to change one's conception of God, nature, man, morals and religion. Moreover, where the texts are the same, distinctions between

the doctrines derived from the text must involve dialectical controversy; yet precise distinctions are possible if one look rather to the method by which they were arrived at than to what is new and unique in the doctrines. Fortunately exact information concerning methods of interpretation is available: Augustine, Abailard, Aquinas, Ockham, Erasmus, Luther, Bacon, Descartes, Spinoza—in general all men who have been called innovators in the history of philosophy—are at pains to state what is at fault in the methods employed by their predecessors or adversaries and to indicate as clearly as they can what the method of arriving at truth should be. The conclusions which are established by diverse methods may be stated in propositions so similar that only a consideration of their grounds will make clear their meanings and remove the ambiguity. Renaissance in philosophy and in intellectual pursuits in general, like refutation which frequently accompanies it, cannot be delineated in a series of propositions which will be recognized to be true or revolutionary; but such truth and novelty as the propositions have can be seen in the orientation and methods by which men turn from doctrine that had been considered true to other aims, other emphases, other doctrines. History is bad philosophy most frequently at those points where the life, attitudes and thought of one age are conceived to have ceased. The Renaissance of the fifteenth and sixteenth centuries is only one among such transitions. However, if transitions are to be viewed as the dialectic of two doctrines and of two ages, it would not be without profit for philosophy to look in the history of such transitions for distinctions in methods and for the marks of what is involved in philosophic refutation and construction. For the question, how a renaissance in general is possible, is a prior question philosophically to that of what the Renaissance

believed or what truth there was in those beliefs. It is our purpose to raise that philosophic question here by translating a historical sequence of ideas, such as the philosophies successively derived from some common source, into the philosophic debate that is implicit in the relations of those ideas. Such a translation will serve to indicate the philosophic aspects of historical interpretation. For the nature of history, the variety of historical interpretations and their origins and principles must be examined before questions of historical truth and accuracy can be considered profitably. The task set in the present essay is only the first stage of that inquiry into the nature of history, or of verbal expression in general; it is a philosophic task if only in that it prepares for the assimilation of questions of historical truth into questions of philosophic truth, but it may incidentally save the historian from the philosophic confusions which he has introduced into his subject matter and which he tries in vain to remove by his scientific techniques.

II

In the estimation of the writers of the period, there were middle ages within what has since been called the Middle Ages. Information concerning these dark periods is usually given together with the news of the rebirth of letters or philosophy, repeated many times before the fifteenth century. Indeed it is not difficult to find in the writings of contemporaries that renaissances have seemed to be dark ages to some who shared in their novelties, and that periods of intellectual gloom have had the appearance of recrudescences of some ancient splendor: the history of histories of such periods has traced the succession of what is sought, what is reborn and what is dead. Apparently in any age there is an antiquity or a phase of antiquity in rebirth and

at the same time innumerable phases desired and irreparably lost. What was to happen to philosophy in particular during the Renaissance was foreshadowed by what happened to philosophical discussion several times in the Middle Ages.

Under Charlemagne and his successors, there had been a renaissance in philosophy: scholars who had been scattered over Europe were invited to the court of the Franks, Alcuin an Englishman, Paul Warnefried a Lombard, Peter of Pisa a Tuscan, Theodulf a Spaniard, Clement an Irishman. They had apparently acquired their erudition in all the corners of the western world; the act of bringing them together in one place precipitated the renaissance in philosophy, for it set them to working on a common subject matter in philosophy and theology, a common set of problems based on a common set of texts, undertaken in accordance with a common method. For two hundred years the problems of philosophy were discussed largely in the ordered terms derived from the study of two works attributed to Saint Augustine, the *Ten Categories* and the *Dialectica*, and from the sections on grammar, rhetoric and dialectic in the poem of Martianus Capella. The many commentaries on these works produced in the period are testimony of the central place they occupied in the scheme of education. The organization of knowledge in general and of the three arts in particular was explored by writers like Alcuin and Rhabanus Maurus, briefly, formally, dryly, by definitions of the arts and of their subdivisions; two great theological controversies, on the Eucharist and on predestination, brought together vast collections of citations from the Church Fathers on those subjects. From the interplay of those citations, philosophical and theological, a great part of them from Augustine, but others from almost all the Latin and Greek Fathers,

with strong Neo-Platonic tendencies from Pseudo-Dionysius, Maximus the Confessor, and John Scotus Eriugena, and with traces throughout of Aristotelian ideas and formulae at second and third hand, the foundations of philosophical problems and solutions were being laid.

Toward the end of the tenth century philosophers turned to a new renaissance, following the lead of Gerbert of Aurillac, later Pope Sylvester II. The new tradition was based on a new series of writings, in general more ancient than those that had been studied; glosses and commentaries, more numerous than those of the preceding age, were devoted to the *Isagoge* of Porphyry, the *Categories* and *On Interpretation* of Aristotle as translated by Boethius, the commentaries of Boethius on those works as well as his original writings on logic, and the *Topics* of Cicero. The discussions of the earlier commentators on Martianus and the Pseudo-Augustine were forgotten; the terms and even the problems shifted, and with the abrupt change of interest the manuscripts of the writers who preceded Gerbert were no longer copied, so that in effect the preceding period became a dark age, notwithstanding that we have the names of famous teachers of that period whose works have not come down to us.

When Abailard wrote during the first half of the twelfth century he enumerated as the sources of his logical ideas precisely the works that had formed the basis of Gerbert's new course. But even Abailard's contemporary and pupil, John of Salisbury, possessed the "new logic," that is, the translation of the whole of Aristotle's *Organon,* and in his lifetime the philosophic renaissance which culminated in the thirteenth century was already under way. It was to take the same general form as the earlier transformation of the subject matter and manner of philosophy; by the beginning

of the thirteenth century great additions had been made to the portions of Aristotle that were available in Latin and shortly after the middle of the thirteenth century the whole corpus of Aristotelian writings had been translated. It is difficult thereafter to find a trace in the writings of the philosophers of the second half of the thirteenth century of the distinctions and preoccupations that had dominated the discussions of the twelfth century or even of the language in which the discussion was conducted. Thus, Abailard had written a *Dialectic* which contained a book for each book of the *Organon* of Aristotle, even for those which Abailard had not been able to read, and his discussions of the *Posterior Analytics* and the *Topics,* though they contain bad guesses if they were meant to be a reconstruction of the Aristotelian doctrine, are works of great logical acumen in which theories are propounded that were later to be advanced again independently of Abailard; these are quite forgotten in the increasing discussions of logic in the late thirteenth and fourteenth centuries, and the reconstruction of Abailard's logical doctrines is the consequence of the scholarly work of the nineteenth and twentieth centuries.

In general, the philosophic renaissances of the Middle Ages were constituted by the broad discussion of problems in terms of a new erudition, based on some ancient work which had been ignored in the preceding age. That ancient writers should in each case be the basis of the renaissance is doubtless no coincidence; nor is it strange that the new erudition should be considered a key to the secrets of nature, that the preceding age in which the key had been lost should be an age of ignorance, and that it should become with passing years, since its writings are neglected in the concern with more ancient authors, its manuscripts little copied and its terminology little used, increasingly an age of slight in-

tellectual activity and accomplishment to the historians who record the awakening. Each step, however, is an advance in the formation of a tradition; at each step, if an apologist were necessary, justification could be found in the increased mass of knowledge and information which had entered into philosophic systematization and argumentation; even the resistances and refutations, at each step, were part of the formation of the tradition, unintelligible without it and, in turn, necessary for the understanding of it. Until the fourteenth century, each transformation was accompanied by a return to some more ancient doctrine. The fourteenth century prepared in the writings of the followers of William of Ockham and of the Averroists for a transformation of philosophy which has been represented as a revolt against the whole tradition of philosophy of the Middle Ages. It does have the peculiarity that, whereas in preceding renaissances philosophers forgot their immediate predecessors in the task of elaborating their newer formulation of philosophic problems, the philosophers of the fifteenth and the sixteenth centuries expended a great deal of their energy in calumniating their predecessors. Their revolt, they said, was against the doctrines of Aristotle; they returned to ancient sources, to Plato, Augustine, Jerome, and the New Testament, but that return was directed in no single channel, even in the sense of possessing a single language or a basic set of distinctions in terms of which to fashion the new philosophy. Instead it becomes increasingly true, as the beginnings of the modern period in philosophy are approached, that each new philosopher strains toward a new philosophic view based on new principles and couched in new terms. The conduct of philosophy in the late Middle Ages had been in the hands first of philosophers who were experts in the philosophy of Aristotle, who spoke his

technical language precisely and who developed in the dialectic of their commentary and controversy on the problems of that philosophy a detailed criticism of it almost point by point; then the conduct of philosophy passed to the hands of philosophers who remembered and repeated these criticisms, who retained in their speech the remnants of the Aristotelian language, though they were becoming progressively less and less versed in the subtleties of that philosophy. The earlier philosophers, for all their diversities, had a common set of problems and a language intelligible to one another; the later set was unified only in what it criticized and calumniated.

This change figures eulogistically in our histories of philosophy as the revolt against authority, the vindication of reason, the discovery of nature and man, which had been effected under the impulse of the spirit newly manifested in commerce, learning and the sciences, and which was to be directed toward the power and utility to be found in knowledge secularized to the problems of this life. For any of these descriptions—and their contraries—abundant confirmation can be found. Their significance lies precisely in the explication of the paradoxes they generate. The humanist discovered nature and man by refusing to follow the lead of Aristotle, of scholastic theology and philosophy; he discovered man and nature in Cicero, Augustine and Plato, by reading Quintillian and the poets and orators rather than Boethius and the dialecticians. Thereafter he vindicated reason by attacking logic; he repudiated authority by citing the heretical unbiblical consequences derived from the scholastic application of dialectic to questions of faith and to the text of the Scriptures; and he found the utility of the new learning as frequently in the salvation of

souls as in the extirpation of mundane suffering and ignorance.

That revolt, moreover, if it is thought to involve the problem of the effect of pagan philosophy on Christian doctrine and learning, raises once more the question of the difference of that effect in two different ages. In the twelfth century, Cicero, Quintillian, the Roman poets and orators were read and admired, as they were in the sixteenth; in both ages learning in Greek and in Hebrew was a not impossible acquisition, but despite the revolutionary effect these languages were thought to have on learning and religion, most writers contented themselves in both periods with a few words with which to sprinkle their works; Plato was in the eyes of many the greatest of philosophers; and the true philosophy was dependent on a reorientation, with or without the aid of the secular arts, of the study of doctrines derived from the Bible. But though such points of similarity between the ages might be drawn out to a lengthy list, at each point the difference involved in the similarity becomes obtrusive: these are doubtless the respects in which the two periods possessed the classics, but differently—how differently may be seen by examining the work of three men who are involved in those points of contrast, Abailard, Erasmus and Luther. Their positions may be considered the corners of a three-sided debate in which men who were contemporaries might have engaged.

Peter Abailard, in the eyes of the pertinacious critic of his lifetime, Saint Bernard, is a temerious innovator who would apply dialectic to all matters of faith (falling thereby into a series of heresies and errors, almost as numerous as those which were later to be found in Erasmus's works as a consequence of his eschewal of dialectic, Arianism,

Nestorianism, Pelagianism, Sabellianism) and who finds in pagan writers anticipations of Christian doctrines (sweating to make Plato a Christian but succeeding only in showing himself a pagan). To Abailard, on the other hand, those who object to his use of examples and likenesses derived from the writings of philosophers seek only a solace for their own ignorance.[4] Both of his great theological works, therefore, the *Theologica Christiana* and the *Introductio ad theologiam,* open with lengthy citations not only from the prophets of the Old Testament but from Greek and Latin philosophers, particularly from the philosophers of the Platonic sect, in which Abailard sees Christian truths prefigured: not only the Trinity, but the precise manner of the relation of the persons (with only a few slips of terminology into which Christian writers, too, fell), the Incarnation, the Redemption, the immortality of the soul, its future pains and rewards. Moreover pagan philosophers lived lives in which were displayed the Christian virtues, love of truth, contemplative and austere modes of living, contempt of riches and even of life, love of virtue, of virginity, of chastity; their reward moreover, Abailard was convinced, would be eventual salvation. In this conception of the relation of pagan and Christian doctrine, he pretends to advance no original discovery of his own; on the contrary his citations from the philosophers were collected, he says, not from their own works, of which he knows but few, but from the books of the holy Fathers.[5] It is Saint Augustine and Saint Jerome who contribute the chief weight of authority to this manner of use of the philosophers, and, as

[4] *Theologia Christiana* III, Migne's *Patrologia latina* (referred to hereafter as PL) 178, 1214.

[5] *Introductio ad theologiam,* II, 1, PL 178, 1039; *Theologia Christiana* II, PL 178, 1170.

citations from their works succeed one another, it becomes apparent that the contribution of the pagan philosophers to Christian philosophy consists chiefly in the seven arts which they perfected, particularly the art of dialectic which is essential to the understanding of Scripture. Without it one cannot understand even what it is that one is to believe, and one faith is as defensible as another, pagan as Christian. Without it one has no arms to withstand the attacks of pagans, Jews and heretics, but, even apart from its great utility to faith, it is to be prized in itself as a gift of the holy Spirit, for no knowledge in itself is evil.

Whence Saint Augustine, as well as other doctors of the Church, holds that the secular arts and especially dialectic itself are absolutely necessary for the sacred Scripture. For that reason, indeed, the aforesaid doctor has dared in book II *On order* to commend dialectic in such wise that he seems to profess it to be the only science, since he says that it alone can make men know. He calls it "the discipline of disciplines, which they call dialectic. It teaches how to teach, it teaches how to learn; in it reason itself presents itself and shows what it is, what it seeks and what it is worth."[6]

Moreover if it gives access to truth it cannot be contrary to faith, for one truth cannot war with another.[7] The *Introduction to Theology* itself, Abailard writes in the Prologue, was prepared at the request of students of his who had

[6] *Introductio ad theologiam* II, 1, PL 178, 1040; see Augustinus, *De ordine*, II, 13, PL 32, 1013.

[7] *Dialectica, Analytica posteriora* I, *Ouvrages inédits d'Abélard* ed. by Victor Cousin, Paris 1836, 434-35: "Si vero adversus fidem militare artem concedant [aemuli mei], eam procul dubio non esse scientiam confitentur. Est enim scientia veritatis rerum comprehensio, cujus species est sapientia in qua fides consistit. Haec autem est honestatis sive utilitatis discretio: veritas autem veritati non est adversa. Non enim sicut falsum falso vel malum malo contrarium potest reperiri, ita verum vero vel bonum bono potest adversari, sed omnia sibi bona consona sunt et convenientia. Scientia autem omnis bona est, et ea quae de malo est, quia justo deesse non potest."

read his philosophic studies and his writings on secular letters and who wanted a summa of sacred erudition from his pen as an introduction to the divine Scripture. It seems to him permissible that the faithful read the writings on the secular arts and books of the gentile philosophers in order to learn the kinds of speech and eloquence and modes of arguments and the natures of things, to be able thus to put to use whatever pertains to the understanding or ornamentation of the sacred Scriptures and to the defense or construction of its truth. The pupils of Abailard considered that he would be able to resolve the controversies that had arisen to disturb the simplicity of faith, precisely because of his training in the studies of philosophy, and particularly dialectic, which seemed the mistress of all reasons.[8] They wanted human and philosophic reasons, and they sought rather what could be understood than what could be said, holding that the utterance of words which the understanding could not follow is superfluous, that what is not first understood cannot be believed, and that it is ridiculous for anyone to preach to others, as some do, what neither he himself, nor those whom he teaches, can understand.[9]

[8] *Introductio ad theologiam,* Prologus, PL 178, 979.

[9] "*De libro Theologiae suae, et persecutione quam sustinuit a condiscipulis. Concilium contra eum.*—Accidit autem mihi ut ad ipsum fidei nostrae fundamentum humanae rationis similitudinibus disserendum primo me applicarem, et quemdam theologiae tractatum De unitate et Trinitate divina scholaribus nostris componerem, qui humanas et philosophicas rationes requirebant, et plus quae intelligi quam quae dici possent effagitabant, dicentes quidem verborum superfluam esse prolationem, quam intelligentia non sequeretur, nec credi posse aliquid nisi primitus intellectum, et ridiculosum esse aliquem aliis praedicare quod nec ipse nec illi quos doceret intellectu capere possent. Domino ipso arguente quod 'caeci essent duces caecorum (Matth. xv, 14).' " *Historia calamitatum,* 9, PL 178, 140-42. Cf. "Quid denique magis ridiculosum quam si aliquis alium docere volens, cum requisitus fuerit de his quae dicit utrum intelligat, neget seipsum intelligere quae dicit vel se nescire de quibus loquitur?" *Introductio ad theologiam* II, 3, PL 178, 1054.

But if the Old Testament, if Paul and the Fathers can be cited for injunctures to use the books of the Gentiles and the philosophers, cautions against vain philosophy and the wisdom of the world are no less frequent in those works. The writers of the eleventh and the twelfth centuries are divided between those who saw in reason and dialectic the source of all error and heresy, and those who saw in them the source of understanding and the one means of defense against error and heresy. The lines of the opposition may seem less sharp since even those who used dialectic and were suspected of excess in its use, could be suspicious of its use by others: Lanfranc could be accused of an excess of dialectic in his commentaries on Paul and could caution Anselm against dialectic;[10] Anselm could undertake to demonstrate the existence of God without the aid of Scripture and could censure the heretical dialectic of Roscelin,[11] and

[10] "Lanfrancus dialecticus et Canturariensis episcopus Paulum apostolum exposuit et ubicumque opportunitas locorum occurrit, secundum leges dialecticae proponit, assumit, concludit." Sigebert de Gembloux, *De scriptoribus ecclesiasticis* 155, PL 160, 582. "De illis quidem, quae in illo opusculo dicta sunt, quae salubri sapientique consilio monetis in statera mentis solertius appendenda; et cum eruditis in sacris codicibus conferenda; et ubi ratio deficit, divinis auctoritatibus accingena, hoc et post paternam amabilemque vestram admonitionem, et ante feci, quantum potui." Anselmus, *Epistola 68 ad Lanfrancum*, PL 158, 1139.

[11] "Quidam fratres saepe me studioseque precati sunt ut quaedam quae illis de meditanda Divinitatis essentia, et quibusdam aliis huic meditationi cohaerentibus, usitato sermone colloquendo protuleram, sub quodam eis meditationis exemplo describerem. Cujus scilicet scribendae meditationis magis secundum suam voluntatem, quam secundum rei facilitatem aut meam possibilitatem, hanc mihi formam praestituerunt: quatenus auctoritate Scripturae penitus nihil in ea persuaderetur; sed quidquid per singulas investigationes finis assereret, id ita esse plano stylo et vulgaribus argumentis, simplicique disputatione, et rationis necessitas breviter cogeret, et veritatis claritas patenter ostenderet." Anselmus, *Monologium*, Praefatio, PL 158, 142-143. "Nemo ergo se temere immergat in condensa divinarum quaestionum, nisi prius in soliditate fidei, conquisita morum et sapientiae gravitate ne per multiplicia sophismatum diverticula incauta levitate discurrens, aliqua tenaci

properly so, since if logic can be the source of arguments that establish the truth, it can be improperly used to serve as the basis of erroneous conclusions. It is proper, therefore, that the defenders of logic should censure it too, that Book II of the *Theologia Christiana* of Abailard, for example, should be concerned with the necessity of dialectic and that Book III should contain a statement of its dangers.

There was an arsenal of traditional arguments to justify the use of pagan letters and arts,[12] repeated again and again, during the period, most of them from the letters in which Jerome defended himself against the recurring charge of polluting the purity of the Church with pagan filth: the chosen people took with them the gold and vessels and raiment of the Egyptians, leaving behind, however, the idols they had fabricated; Moses, Joseph, David had profited

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illaqueatur falsitate. Cumque omnes, ut cautissime ad sacrae paginae quaestiones accedant, sint commonendi; illi utique nostri temporis dialectici (imo dialectice haeretici, qui non nisi flatum vocis putant esse universales substantias, et qui colorem non aliud queunt intelligere quam corpus, nec sapientiam hominis aliud quam ni animam) prorsus a spiritualium quaestionum disputatione sunt exsufflandi.'' Anselmus, *Liber de fide trinitatis et de incarnatione verbi, contra blasphemias Ruzelini sive Roscelini,* 3, PL 158, 265. It is to be noted that the dialectic of Anselm differs from that of Abailard in the important respect that whereas Anselm undertakes to demonstrate by the necessity of reason alone, without Scriptural quotation, Abailard undertakes to demonstrate by conciliating many texts. The two projects are brought closer together however by Anselm's further statement that none of his conclusions are inconsistent with what the holy Fathers and in particular Saint Augustine wrote, and his recommendation that the reader study Augustine's *De Trinitate* before following his demonstrations. In both Anselm and Abailard, the dialectic explores by reason the consequences of faith; Anselm indeed entitled his *Monologium* ''An example of one meditating on the reason of faith,'' and his *Proslogion* ''Faith seeking understanding,'' while Abailard can deduce all his philosophy from the faith in the Trinity.

[12] Cf. J. de Ghellinck, ''Dialectique et dogme aux X-XII^{e} siècles,'' in *Beiträge zur Geschichte der Philosophie des Mittelälters,* Supplementband I, 1913, pp. 79-99.

by the arts of the Egyptians, Babylonians, Chaldeans; instructions are given in Deuteronomy[13] for the mode of preparing the captive woman to be taken as wife by shaving her hair, cutting her nails and bathing her; David used Goliath's sword against him; Solomon at the opening of the Book of Proverbs admonishes that one know wisdom and discipline, the words of prudence, parables and the obscure words, sayings and enigmas of wise men;[14] Paul quotes from the pagan poets and philosophers, from Epimenides,[15] from Menander,[16] Aratus.[17] In Abailard these arguments are joined to the conviction that no knowledge or science can be evil, that even the science of that which is evil is good, since it alone gives us power to avoid the evil, and power over evil is good.

If any science were evil and if it were evil to know anything, then not even God who knows all things could be absolved from evil. For the plenitude of knowledge is in him alone whose gift is all knowledge. For knowledge or science is the comprehension of the truth of things which are, and he discerns all things truly before whom things which are not are as things present.[18]

Those who are learned in sacred letters will recognize that spiritual men grasp sacred doctrine rather through study of science than through merit of religion; the saints who before their conversion had greater knowledge of the secular sciences had greater command of sacred erudition after their conversion. Paul the Apostle seems no greater in merit than Peter, nor Augustine the Confessor greater than Martin; yet each of them had greater grace in doctrine after

[13] Deut. 21: 23 ff.
[14] Prov. 1: 1-7.
[15] Titus 1: 22.
[16] I Cor. 15: 33.
[17] Acts 17: 28.
[18] *Theologia Christiana* III, PL 178, 1213.

their conversion to the extent that they had greater knowledge of letters before.

But though Augustine, the greatest of the ecclesiastical doctors, and Jerome had read in the writings of philosophers and were particularly well versed in the philosophical arts, when they had turned from the Gentile philosophy to the true wisdom, which is Christ,[19] they saw none the less that the arts are not always used to proper ends. Of the three, grammar, rhetoric and dialectic, it is grammar that Abailard finds particularly dangerous; indeed poetic figments, which are customarily treated in books entitled "Grammar," are interdicted to the Christians. Consequently Abailard draws up an impressive list of citations against the grammarian. Jerome, who had been quoted in approbation of dialectic, is now cited in condemnation of grammar and rhetoric, "The songs of the secular poets, the science of the rhetoricians, the pomp of words are the food of the devil."[20] " 'What communion hath light with darkness? And what accord hath Christ with Belial?'[21] What has Horace to do with the Psalter, Virgil with the Gospel, Cicero with the Apostle?"[22] Isidore too is quoted to the same effect:

The books of the Gentiles are to be avoided for the love of the sacred writings. . . . The pretence of the art of grammar is not to be set above more simple letters, for common letters which are more simple and which pertain only to the humility of those who read are better, and the others are worse because they induce in men a pernicious elation of the mind. Grammarians are better than heretics. For here-

[19] *Introductio ad theologiam* II, 2, PL 178, 1041-1042.
[20] *Introductio ad theologiam* II, 2, PL 178, 1042: Hieronymus, "Epistola 31, ad Damasus de duobus Filiis" 13, PL 22, 385.
[21] II Cor. 6: 14.
[22] *Introductio ad theologiam* II, 2, PL 178, 1042: Hieronymus, "Epistola 22, ad Eustochium, Paulae filiam" 29, PL 22, 416.

ties administer a draught of deadly potion when they persuade men, whereas the doctrine of grammarians can even be of aid to life, when it has been turned to better uses.[23] Decisions of a council and Augustine are quoted to the same effect, and the criticism of grammar and rhetoric is shown finally as a continuation of Plato's objections to the poets and of the censure which Boethius directs, in the person of philosophy, against the poetic muses.

In Abailard's work, however, the dialectic of citation is pursued conscientiously, and although the criticisms he has cited are of the poets, not of the liberal arts in general, quotations from Ambrose are reminders of the dangers of dialectic and philosophy.[24] Ambrose finds that heretics derive all the force of their poisonous doctrines from dialectical disputations in which the doctrines of philosophers are defined, not for their power to construct, but because of zeal to destroy. Once more the Apostle Paul lends powerful support to the attack on dialectic.[25] "Take heed lest there shall be any that maketh spoil of you through his philosophy

[23] *Ibid.* PL 178, 1043: Isidorus *Sententiarum libri tres* III, 13, 2 and 10-11, PL 32, 686-88. Abailard's quotation from Isidore differs slightly from the text of Isidore; since those variations are verbal (with the possible exception of the substitution in Abailard of "utility" for "humility"), the translation above follows the original, which is clearer, rather than Abailard's version.

[24] *Introductio ad theologiam* II, 2, PL 178, 1044 ff. Abailard himself attributes the attitude of his contemporaries toward him to their judgment of his logic. "Odiosum me mundo reddidit logica. Aiunt enim perversi pervertentes, quorum sapientia est in perditione, me in logica praestantissimum esse, sed in Paulo non mediocriter claudicare cumque ingenii praedicent aciem, Christianae fidei subtrahunt puritatem. Quia, ut mihi videtur, opinione potius traducuntur ad judicium, quam experientiae magistratu. Nolo sic esse philosophus, ut recalcitrem Paulo. Non sic esse Aristoteles, ut secludat a Christo. *Non enim aliud nomen est sub coelo, in quo oporteat me salvum fieri* (Acts 4:12)." *Confessio fidei ad Heloissam,* PL 178, 375.

[25] *Theologia Christiana* III, PL 178, 1216 ff.

and vain deceit, after the tradition of men, after the rudiments of the world and not after Christ.''[26] ''But if any man seemeth to be contentious, we have no such custom, neither the churches of God.''[27] ''Charge them in the sight of the Lord that they strive not about words, to no profit, to the subverting of them that hear.''[28] Moreover, just as Abailard repeated most of the customary arguments for borrowing from the pagans, so too there reappear in his writings most of those heretical syllogisms based on fallacious major premisses which were the common property of his century and which dialectic was charged with importing from natural philosophy to the confusion of the divine knowledge: If one is a virgin, one never gives birth; if one is blind, one never sees again; what is eternal is not temporal; what is invisible is not visible; what is God is not man; what dies is not divine.

Abailard contends, however, that these citations contain arguments not against the use of dialectic, but against the sophistical and fallacious use of it. Even Aristotle, he repeats, was aware that it could be put to such uses, since he provided arguments against sophisms.[29] Most important and recurrent of the misuses of dialectic is the application of it to what is not intelligible. The arts are indispensable to an understanding of the sacred writings; but they cannot be applied to the understanding of the divine nature. Even more, there is a great difference between divine and human tradition, between spiritual and animal philosophers, between the disciplines of sacred and secular writings. The ten categories are necessary to the understanding of the

[26] Col. 2: 8.
[27] I Cor. 11: 16.
[28] II Tim. 2: 14.
[29] *Theologia Christiana* III, PL 178, 1216; ''Epistola 13, Invectiva in quemdam ignarum dialectices,'' PL 178, 354.

natures of things; they do not apply to God. Words take on a variety of meaning in the mundane sciences; when they are transferred from creatures by similitude to God they take on a totally different meaning. For words were invented to manifest human ideas, but God, since he exceeds human understanding, is ineffable, and the things which are said of him in parabole, enigma, and likeness express rather something to be suspected of that ineffable majesty than something to be understood.[30] It is a doctrine of Abailard's, which he learned from Plato and Boethius,[31] that words should be cognate with the things to which they are referred, and therefore when words are transferred to the singular nature of God they take on a particular significance and construction, and pass from their proper institution as their object exceeds all things. Without deserting his advocacy of the arts, therefore, Abailard can say with Gregory that he judges it extremely improper to restrict the words of the divine oracle under the rules of the grammarian Donatus. The rules of the philosophers apply to the natures of things and to their daily uses, not to the nature and will of the divine power that rules all natures. A thing is said to be possible or impossible when natures agree or disagree, but such estimations of antecedents and consequences are according to a faculty of creatures, not a measure of divine power. Those who are more learned in the arts can succeed better in sacred erudition; but it is the pure of heart, not the learned, who attain to a knowledge of God with the aid of his revelation. The Scriptures are unintelligible unless they are approached with the aid of the seven arts, but those arts do not apply to God.[32] It is by simple faith that we are saved, and the Christian proceeds from faith

[30] *Theologia Christiana* III, PL 178, 1246.
[31] *Ibid.*, 1245.
[32] *Ibid.*, 1220.

to understanding; he does not come to faith through understanding, nor does he, if he cannot understand, recede from faith. But when he succeeds in attaining to understanding, he is delighted; when he is not able to, he venerates what he can not apprehend.

Against the background of this notion of the place of philosophy in relation to faith, the work of Abailard and his labors in philosophy and theology, his conception of nature and the function of thought, appear as integrated parts of a single philosophic prospectus. All philosophy and all action are based on a faith as on a metaphysical foundation.

We set as foundation of all good things the faith of the holy Trinity, in such wise that the beginning of all goods is derived from the very knowledge of the divine nature. Whoever, consequently, should be able to weaken that foundation, leaves to us nothing of those things which are built upon that foundation.[33]

Attacks on that foundation no less than the defense against such attacks come from two sources, authorities (that is, literally, statements by authors) and reason. Abailard is fond of repeating a quotation which he attributes to Cicero, that all disputation and controversy is concerned either with a writing or a reason.[34] The relation of the two to each other, like the relation of the arts to theology, is double: authority is prior to reason in all things, but particularly in those which pertain to God since they exceed reason,[35] but equally truly on the other hand it is only by reason that those things can be grasped, however imperfectly, and errors in them be avoided. A thing is not believed because God says it, but it is received because one is convinced that it is

[33] *Introductio ad theologiam* II, 2, PL 178, 1040.
[34] *Ibid.*, 1, PL 178, 1039; *Theologia Christiana* II and III, PL 178, 1171 and 1211, etc.
[35] *Theologica Christiana* III, PL 178, 1171.

so.[36] The philosophers were able to anticipate the fundamental truth of the Christian philosophy, the Trinity, because the marks of it were scattered about them accessible to the human intellect: their statements, no less than those of the Fathers, were attempts to indicate a common reality, and the philosophic discipline consists in a dialectical examination of the forces of the reasons which they disposed. Augustine is quoted for the rationale of this conception of reason: "The order of nature is such that when we say anything, authority precedes reason, for a reason can seem infirm, which, once it shall have been rendered, does not thereafter depend on the authority through which it was formed."[37]

On all the questions which he discusses, therefore, Abailard is careful to assemble the variety of things that have been said. It is possible to quote him as if he had nothing to advance which was not screened by the authority of Paul or Augustine or Jerome or Ambrose; on the other hand he may be quoted as the bold critic who presumed to set forth contradictions in the Fathers, to find Anselm's analysis of the Trinity inadequate, and who was himself twice condemned for the excessive rationalism of his alternative analysis. Abailard conceived the task of philosophy to be precisely to disclose the meanings of various statements he quotes, how the reasons are related, what the arguments demonstrate. This is the task of the three arts. Grammar is used for the explication of the meaning of words, by examining the variation of their significances with the variation of context, speaker, auditor, time and place. The *Sic et non* is thus a vast grammatical exercise in which Abailard

[36] *Introductio ad theologiam* II, 3, PL 178, 1050.
[37] *Ibid.*, 1, PL 178, 1039: Augustinus, *De moribus ecclesiae Catholicae* I, 2, 3, PL 32, 1311.

assembled some 1,800 texts ordered according to 158 questions to which they rendered apparently contradictory conclusions: in the "Prologue" to the work he furnishes the rules for the interpretation of the texts, which are precisely those that the grammarian had given for the understanding of any writing. The contradictions, however, are not irresoluble: most of those that are raised in the first part of the *Sic et non* are answered in the first parts of the *Theologia Christiana* and the *Introductio ad theologiam*,[38] of which unfortunately only the first portions have come down to us. There the task is dialectical: the meanings having been expounded, their agreements and disagreements are set forth, and where the arguments are fallacious they are refuted. Rhetoric falls into a subordinate place to be invoked only when figurative expressions and developments are involved. But herein lies

[38] Thus Question I of the *Sic et non*, "Quod fides humanis rationibus sit adstruenda, et contra," is considered dialectically in the *Introductio ad theologiam* II, 3, PL 178, 1048-1051; the dependence of the argument on the quotations collected in the *Sic et non* may be judged from the fact that of the 30 quotations brought together in Question I of that work, 12 are repeated explicitly in those pages (and 2 more within the radius of ten columns). Question 2, "Quod fides sit de non apparentibus tantum, et contra," is taken up in the *Introductio ad theologiam*, I, 2, PL 178, 984-985, where 8 of the 11 citations collected in the *Sic et non* are used; the argument is summarized in the *Epitome theologiae Christianae* 2 PL 178, 1696, where 3 of the citations are preserved. Or again Question 15, "Quod Deus non genuit se, vel quod etiam secundum divinitatem filius factus sive creatus dicatur; vel quod principatu quodam sive auctoritate praecedat pater, et contra," is determined in the *Introductio ad theologiam* I, 16, PL 178, 1009-1012 and the *Theologia Christiana* I, 5, PL 178, 1141-1144, in both of which 15 of the 30 citations of the *Sic et non* are used (3 of the remaining 15 being used elsewhere in the *Introductio*). Or again, Question 18, "Quod aeterna generatio filii narrari vel sciri vel intelligi possit, et non" is taken up in the *Introductio ad theologiam* II, 3, PL 178, 1052-1055, where 6 of the 15 citations are used. There can be no doubt of the close dependence of the discussions of the theological works upon the materials brought together in the *Sic et non*, notwithstanding that the portions of these works that have come down to us cover less than a quarter of the questions of the *Sic et non*.

the whole task of philosophy: the examination by reason of the various theories that have been advanced concerning the nature of things. By his approach Abailard discovered greater accord among the philosophers than has been found by other approaches, for his concern is to discover that aspect of reality which the philosopher was attempting to express, and it turns out more frequently that two philosophers in disagreement are writing of two different things than that they are writing, one correctly, the other incorrectly, of the same thing. But any other approach than this, Abailard repeatedly contends would be fallacious, sophistical or at the least irrational and unphilosophic.

Abailard cannot be taken in a detailed sense to be a precise representative of his age, but in this concern to gather the significant texts of any controversy, discipline or science from philosophers, Scriptures, Fathers and decrees of councils, he worked as did most of the grammarians, theologians and canon lawyers of the century. This was the time in which the collections of canons had reached the completion of their systematization in Gratian's *Concordance of Discordant Canons* which was to be known to posterity as the *Decreta;* it was the time when dozens of collections of Sentences were prepared as systematic résumés of the whole of theology, including the efflorescences of controversies, from those in which Augustine had engaged, to those like the discussions of the Eucharist and predestination which had disturbed the court of the Frankish kings. Even less comprehensive résumés, like the *De sacramento corporis et sanguinis Dominici* of Alger of Liège,[39] or the *De sacramentis Christianae fidei* of Hugo of Saint Victor,[40] run through the classical sequences of texts. Indeed it would be no exaggeration to say

[39] PL 180, 759 ff.
[40] PL 176, 174 ff.

that the chief lines of the discussions of the twelfth century were laid by a collection of no more than three thousand texts which are repeated again and again in the writings of the time.

The twelfth century did a thorough piece of grammatical preparation for the dialectical developments of theology in the thirteenth century. One of the Books of Sentences prepared during the century by Peter Lombard (who died in 1164) was to become the basis of theological education: like the *Sic et non,* by which apparently Lombard was influenced, it is fundamentally a collection of quotations for the most part from the Church Fathers on important questions ranging from the nature of God through the work of creation, the redemption, the sacraments, the last judgment, back to heaven. By the thirteenth century the basic course in the Faculty of Theology of the new universities was the explications on the *Book of Sentences:* from these courses resulted hundreds of commentaries on the *Sentences* of Lombard, and most of the great philosophers, Bonaventura, Thomas Aquinas, Duns Scotus, William of Ockham among them, were authors of such commentaries and frequently gave in them the most complete statement of their philosophic views. During the thirteenth century, Roger Bacon (who died in 1294) makes, as one of the points of his criticism of the study of theology, the statement that the expounder of the *Sentences* has taken precedence over the expounder of the Bible; and by the fifteenth century Gerson (who died in 1429) finds that the Bible had been forgotten in the study of Peter Lombard. During this period there were men to protest against this dialectical organization of theology in the rational systems of theologians and in the technical disputation of theological problems. But in the Renaissance that protest against scholastic theology, and with it scholastic philosophy,

assumes a proportion to drown out the defenses of the last practitioners of the method. And it was in contrast to the doctrines and analyses of their predecessors that the humanist was able to view himself constructing a new learning from the works of antiquity and the reformer to view himself rediscovering God, and Moses and Paul in the Bible. What this discovery of man, nature and God consisted in, is involved in the answer to the question, What became of grammar, rhetoric and dialectic in the Renaissance?

III

As Abailard may be taken as an extreme example of the activity of his contemporaries, collecting and sorting texts, and fitting them to the statement of a Christian doctrine, so Erasmus may be viewed as a culmination of a later tendency which had been vocal even before Petrarch complained in the fourteenth century of the eternal disputes, endless definitions and reasoning of dialecticians. According to Petrarch they derived their chief pleasure from the fight itself, not from the discovery of truth, and Petrarch refused, to the horror, as he paints the situation, of his Averroistic friends, to discuss on the authority of Aristotle things which could be proved neither by reason nor by experiment. Though they differed from Abailard in the relative emphases they would give the arts, Petrarch or Erasmus would not condemn the liberal arts, not even logic, since they are the necessary preparations, the instruments to be used to penetrate to philosophy. But Petrarch would grant that logic is a road which it is proper to traverse, though it does not follow that we should linger on it forever; what he condemned is not the liberal arts, but the hoary-headed children who have spent their lives in the study of them.[41] The dialecticians of the day

[41] Cf. Erasmus *De ratione studii,* Opera Omnia, Leyden, 1703, I, 522: "Ad haec si quis Dialecticen addendam statuet, non admodum refraga-

are at fault, not the ancient philosophers whom they profess to use, not even Aristotle, for they misconceive and refute even him together with Pythagoras and Plato, Cicero, Varro and Seneca. The task of the new learning was to rescue the philosophers from the quibbles of scholastic philosophy as it was to rescue the Bible and the Fathers from the degradations and stultifications of scholastic theology.

Both Abailard and Erasmus were concerned with a true philosophy, which they called the philosophy of Christ; both held that its truth was such that the ancient philosophers could not entirely have ignored it; both conceived that the works of antiquity could therefore be of some utility in preparation for and induction to that philosophy, and both, when they discuss the manner of that anticipation, bring the arts of grammar, rhetoric and dialectic prominently into the discussion. But there the similarities end: when Abailard undertakes to show in what the ancients had anticipated the true doctrine, he finds traces of the doctrine of the Trinity which is for him the basis of all philosophy and action; for Erasmus, on the other hand, the anticipations of the philosophers are to be found rather in the ways of life and the virtues which the philosophers could not help finding. To the humanist it seemed significant that the Platonic philosophers should have made so much of the immortality of the soul; but of the doctrine of the Trinity few humanists could find a trace in antiquity or, for that matter, in the Bible. Any aid to knowledge, particularly the three arts, should be cultivated by the Christian philosopher according to Abailard, for all knowledge is good. According to Erasmus, though

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bor, modo ab Aristotele eam discat, non ab isto loquacissimo Sophistarum genere, neque rursum ibi desideat, et velut ad Scopulos (ut inquit Gellius) Sirenaeos consenescat."

many things are to be found in the books of the pagans which are in agreement with the philosophy of Christ, that philosophy is expressed most perfectly and efficaciously by Christ. No faction of philosophy was ever so crass as to teach that money makes men happy, none so impudent as to set the end of good in vulgar honors and pleasures. Thus the Stoics saw that no one is wise except the good man; they saw that nothing is truly good or honorable except true virtue, and nothing is evil or to be avoided, except only baseness. Socrates, Plato, Aristotle likewise taught something of the nature of virtue and of goodness; and Diogenes, Socrates, Epictetus illustrated such doctrines in their lives. But no one taught and exemplified them so fully as did Christ, and it is a great wonder therefore that men should take a lesser archetype than Christ himself or seek to learn the wisdom of Christ from the letters of men rather than from Christ himself speaking in the letters of the Evangelists and the Apostles.[42]

The locus of the philosophy of Christ has shifted sharply in Erasmus from understanding to practice: one has learned to be a true theologian not when one has learned to twist syllogisms in accordance with art, but when one has learned to show in one's emotions, in one's countenance and eyes, in one's very life, the results of the true teaching.

This kind of philosophy is situated more truly in the emotions than in syllogisms, it is a life rather than a disputation, an afflatus rather than erudition, a transformation rather than reason. To be learned is the lot of only a few; but no one is unable to be Christian, no one is unable to be pious, and I add this boldly, no one is unable to be a theologian. For that which is most of all in accordance with nature descends easily into the minds of all. But what else is the

[42] Erasmus, *Paraclesis,* Opera Omnia, V, 141 F-142 E.

philosophy of Christ, which he himself calls a rebirth, than the instauration of a well founded nature.[43]

That is not achieved by disputing concerning thorny and difficult perplexities of words, concerning instances, relations, quiddities, formalities, but by holding to and expressing what Christ taught and exhibited. It is important, first, to know what he taught; second, to perform it.

On the authority of Augustine in his *De doctrina Christiana*, a work on which Abailard had relied for his argument, Erasmus is not averse to a cautious and sober use of the arts or to reading human books with judgment and delight. Thus, if anything turns up which is not in accord with the divine nature or which seems to be contrary to the doctrine of Christ, as that God should be enraged or touched with repentance, since the Christian faith holds it for certain that God is immune from such emotions, one should not therefore hold the writing in contempt, but should believe rather that one does not follow the sense of what is read, or that there is a figure of speech involved in the words, or that the text is corrupt. These rules, it is to be remarked, all figure

[43] *Ibid.*, 141 F. Cf. *Epistola de philosophia evangelica, Opera VI*, printed at the head of the edition of the New Testament, but without page number: "Quum Vetus Testamentum fuerit umbra ac veluti progymnasma Philosophiae Euangelicae, quumque Euangelica doctrina sit instauratio simul et perfectio naturae, ut erat primum condita sincere, mirum videri non debet, si Philosophis quibusdam Ethnicis datum est, naturae vi quaedam animadvertere, quae cum doctrina Christi consentiant, quum, teste Paulo, iisdem contigerit ex visibili mundi fabrica ea colligere, quae non oculis, sed animo comprehenduntur, usque ad sempiternam Dei virtutem ac divinitatem; et maxime congruebat, ut nihil adferret Christus, cujus non aliqua vel umbra, vel scintilla praecessisset in Veteris Testamenti libris, quo propensior esset omnium fides, ad rem non omnino subitam atque expectatam. Primum igitur quicquid Christus praestitit, promissum est sacrorum Vatum oraculis, adumbratum est figuris, et carptim etiam expressum est, veluti subinde promicantibus hinc atque hinc scintillulis aliquot, quae lucem illam, post erupturam, orbi portenderent."

among the grammatical devices which Abailard proposes in the Prologue of the *Sic et non* for the interpretation of texts. But whereas Abailard is fearful lest one be led by grammar and rhetoric from the true understanding which dialectic alone can procure, the hope of Erasmus centers on the art of grammar, and his suspicions fall on rhetoric and, to a much greater degree, on dialectic.

Among the human disciplines, different disciplines have different ends. With the rhetorician you are concerned to speak copiously and splendidly; with the dialectician to reason subtly and to trap your adversary. Let this be your one and only end, perform only this vow, only this one thing, that you be changed, that you be seized, that you be breathed, that you be transformed into those things which you learn. Only thus is the food of the mind useful, not if it remains in the memory or the stomach, but if it is conducted to the emotions and the very viscera of the mind. Only then should you seem to yourself to have made progress, not if you dispute more keenly, but if you perceive yourself little by little made other, less proud, less wrathful, less desirous of money, of pleasures or of life, if daily something fall away from your vices and something be added to your piety.[44]

The more elegant disciplines which please Augustine in the *De doctrina Christiana,* Erasmus says are not displeasing to him. Rhetoric, dialectic, arithmetic and music are useful precisely in the sense that the divine pages are not intelligible unless one understands the nature of the things that are mentioned there, and the arts will help you to an understanding of the words and things. But dialectic alone is insufficient. If you are ignorant of the nature of the things of which you dispute, what do you divide, define, infer? Of what use is it to have constructed a syllogism

[44] *Ratio seu methodus compendio perveniendi ad veram theologiam,* Opera V, 77, B.

in Celarent or Baroco, when disputing of crocodiles, if you do not know whether a crocodile is a kind of tree or animal? This is information which is to be derived, not from Aristotle's *Physics,* which is studied in the schools, but from his works *On Animals, On Meteors, On the Soul, On the World,* from the commentaries on them, and from the treatises of philosophers and even poets on plants, winds, gems, beasts, even on the superstitious sciences. More useful still are the treatises on the things and names in the Bible such as Eusebius had prepared and after him Jerome, in his treatise *On Hebrew Names.*

Rather than in dialectic and its subtleties, which even the pagans had derided in pagan philosophers and which Paul detested in a Christian, the culmination of the utility of the arts when transferred from secular letters to theology is to be found in the study of theological allegories, in which Origen had excelled, and of the commonplaces of theology in which Chrysostom had been preëminent. This is what Augustine had in mind when, in the *De ordine,* he sent Licentius back to his poetic muses, indicating thus that poetics is to be numbered among the liberal arts.[45] Origen's explanation of the temptation of Abraham is cited as an instance in which it is difficult to tell whether he affords more pleasure or more utility to the reader, simply developing the historical sense of the passage, and doing no more in the interpretation of the divine books than the grammarian Donatus did on the comedies of Terence to make the meaning of the poet clear. There is a grammar, practiced in recent years, which Erasmus thinks is lost in futile and cold questions; the grammar which he praises, however, is that practiced by the old theologians, Origen, Basil, Chrysostom, Jerome. His defense is against those who su-

[45] *Ratio verae theologiae,* Opera V, 79C-81B.

perciliously despise grammar, rhetoric and poetics as puerile. Poetic figures and tropes are found everywhere in the writings of the Prophets; Christ used paraboles; Paul cites the poets; innumerable theologians, among them Augustine, studied the grammatical, poetic, rhetorical schema and figures of the Bible, and Augustine called his work, not Christian grammar or dialectic, but *On Christian Doctrine,* which is no other than theology. One would look in vain, in these sources, for references to Aristotle, to first and second intentions, syllogistic forms, quiddities, haecceites or the scholastic method of division and subdivision. Or again, the manner of this doctrine of Christ can be both stated and illustrated in the allegory of manna in the Old Testament. For manna is the adumbration of the knowledge of the secret law; that it was not of earthly origin but was rained from heaven indicates, as the difference between human and sacred letters, that the whole sacred Scripture was divinely inspired and the work of God, its author. The smallness of manna figures the humility of the speech, which conceals vast mysteries in words that are almost unclean. Its whiteness indicates that there is no doctrine of mortals which is not soiled with some blackness of error, but only the doctrine of Christ is snowy, white, wholly pure.[46] And so one by one the characteristics of manna are seen as the signs of the character of the philosophy of Christ, and since that philosophy is involved in figures, it is proper, as preparation for it, to read in "the letters of the poets and Gentile philosophers," provided one do it in passing, at the proper times of life, and not in excess. This is the admonition of Basil, Augustine, Jerome, Cyprian.

Those letters form and animate the youthful spirit and prepare it marvelously for the understanding of Divine

[46] *Enchiridion militis Christiani,* 2, Opera V, 6F-7A.

Scriptures, since it is almost a kind of sacrilege to burst directly upon them with unclean feet and hands. Jerome censured the impudence of those who, trained only in secular letters, dared to treat of the Divine Scriptures. But how much more impudently do they act, who dare to do it, without having tasted even of secular letters. Moreover, as the divine Scripture does not have much fruit if you remain in and adhere to the literal meaning, so too the Homeric and Vergilian poetry is very useful if you remember that it is all allegorical, a statement which no one will deny who has so much as tasted even with the tips of his lips the learning of the ancients. I would advise you, however, not to read the obscene poets at all or certainly not to examine them too closely, unless perchance you should wish to learn to be horrified more at the vices described and at the discord of sinful men and to love honorable things more vehemently.Of the philosophers, moreover, I should prefer you to follow the Platonists, for this reason, that they approach in a great many statements as well as in the very manner of their speaking very closely to the Prophetic and Evangelical figures. Briefly, it will have been profitable to taste all pagan literature, if only it be done, as I have said, in the proper years, moderately, cautiously and with pleasure; in the second place, quickly, in the manner of a tourist rather than an inhabitant; finally, what is most important, if all things are referred to Christ.[47]

It is not his intention, Erasmus says, to condemn the studies which are treated in the schools: they should be treated soberly and chastely, and they should not be the only studies. What he objects to is that the theologian should never dare to proceed beyond the philosophy of Aristotle but should, as preparation for theology, grow old in profane studies. As to one who drinks wormwood, all things taste of wormwood, so to one who spends the good part of his life with writers like Bartholus and Baldus,

[47] *Ibid.*, 7E-8A.

Averroes, Holcott, Bricot, and Tartaretus, in sophistical disputes and in confused little summae and collections of theology, the sacred letters do not savor as they are but of that which is brought to them. Chrysippus had been criticized because whole tragedies were to be found in the commentaries which were supposed to deal with logic; Erasmus finds it far more reprehensible that the whole of Aristotle should be found in the commentaries of theologians, and against the reply that without such exact knowledge one cannot be a theologian, he consoles himself with the example of Chrysostom, Cyprian, Jerome, Ambrose, Augustine, Clement, content to be a rhetorician with them rather than a theologian with later writers who seem to themselves to be other than men. Abailard was impressed with the good of all knowledge; Erasmus prefers to quote Seneca: "Certain things it is proper to have learned not to learn."[48] Where Abailard asks what there is in common between the poets and the Scriptures, Erasmus asks what there is in common between Aristotle and Christ.[49]

Yet the materials with which the new learning worked were the same as those of scholastic theology. When Erasmus replies to a critic who accuses him of condemning the whole of scholastic theology, of being strangely antipathetic to the name of Aristotle, of thinking that the whole of philosophy should be segregated from the study of the-

[48] *Ratio verae theologiae,* Opera V, 83 A-F. Cf. John of Salisbury, *Metalogicon,* I, 24, ed. by Clement C. J. Webb, Oxford, 1929, 57: "Unde inter virtutes grammatici merito reputatum est ab antiquis, aliqua ignorare."

[49] Abailardus (quoting Jerome), *Introductio,* II, 2, PL 178, 1042 D: "Quid facit cum Psalterio Horatius, cum Evangelio Maro, cum Apostolo Cicero?" Erasmus, *Epistola apologetica ad Martinum Dorpium Theologum,* Opera IX, 8: "Quaeso, quid commercii Christo et Aristoteli? Quid sophisticis captiunculis cum aeternae sapientiae mysteriis?" Cf. *Paraclesis,* Opera V, 139F-140A.

ology, he can reply that there is really little difference between them: they both think that the perfect theologian would be one who joined the liberal disciplines to an exact knowledge of the Scriptures, and there should therefore be no quarrel between them.[50] With that much in common, however, all the differences that separate the medieval method from that of the Renaissance are still possible. The differences, none the less, are as simple to state as the similarity: the task that Erasmus set for himself was the interpretation of a document to discover precisely what Paul said, or what the evangelists said, as indication ultimately of the philosophy of Christ. That Plato or Pythagoras or even Moses, may have said something similar is irrelevant to the problem; all the devices of the arts are exploited to determine the authenticity of the document, the accuracy of the text, the precision and sufficiency of the interpretation. Abailard, on the other hand, set as his task to discover truth by examining the various statements that had been made on a given problem. Having set the problem, as, "whether God the Father alone is unborn," it is not only relevant but important to gather together what the Greek and Roman philosophers, the Hebrew prophets, the Evangelists, the Apostles and the Church Fathers have said on the subject. For all of them, with their varying data and abilities, were attempting to resolve the same problem, and Abailard's method is to seek, behind the statements of many writers, the identical truth which they all faced, some stating it more adequately than others, some misstating it; but truth will reinforce and lead to further true proposi-

[50] *Responsio ad Albertum Pium*, Opera IX, 1168: "Si quid tale delatum fuisset e lucubrationes meis, quantopere clamasset me detrahere Scripturis, in quibus, ut ipse docuit alibi, nullus apiculus vacat mysterio. Colligit tamen perfectum Theologum fore, qui liberales disciplinas cum exacta Scriptuarum cognitione conjunxerit. Idem ergo prior docui. Cur ergo mecum litigat?"

tions and the error of erroneous statements is made clear by the true statement.

The difference between the method of Erasmus and that of Abailard may therefore be stated as that between a use of the three arts oriented to an understanding of a passage (that is, the three arts arranged in accordance with the needs of grammar) and the use of the three arts oriented to a comparative estimation of a variety of arguments (that is, the three arts arranged under the dominance of dialectic). For the first, dialectic affords slight utility but great danger by the intrusion of needless subtleties; for the second, grammar is useful for the dialectician in determining the meaning of what had been said, but it presents the dangers to systematic, true and useful thought that philosophers have so frequently seen in the desertion of literal, unequivocal meanings for concern with the figures and analogies of poets. Abailard's pupils had hoped to clear away the controversies of theology by the aid of a dialectician; Erasmus thought of the theologian as possessed not with points of doctrine, but with a way and habits of life—if a controversy arose concerning an important text, the one recourse was to emend the text or perhaps correct the translation. Even Augustine is quoted as having sent an adversary, Cresconius, to the Greek text to correct the absurdity of a quotation from Ecclesiasticus, and the great fruits of Augustine's interpretation of the Old Testament of the Septuagint would have been greater still if he had known Hebrew. But of all the Fathers it is Jerome who is the surest guide, according to Erasmus, for he saw the need of Greek and Hebrew studies for the theologian; he refuted Augustine, Hilary and Ambrose, who thought that the Septuagint translation was good enough;[51] he finally was least tempted to

[51] *Ratio verae theologiae,* Opera V, 78A-79C.

leave off the solid work of the theologian for philosophic subtleties.

The change in the relation of the three arts, particularly of grammar and dialectic, to one another, has the curious result of transforming the natures of the arts as they are conceived from the two points of view and consequently changing the significance of works that are read in either of the two ways. For Abailard, grammar is the art of exploring the meanings of texts, in need, however, of the aid of dialectic whenever difficulties are found; for Erasmus, too, grammar is the art of exploring the meanings of texts, but no difficulty can arise for the solution of which, if it is soluble, grammar is not sufficient, since grammar can resort, in the one direction, to the criticism of manuscripts and translations, in the other, to figurative usages.[52]

[52] Erasmus, like Abailard, distinguishes between the function of the scholar interpreting a text and that of the sage or the prophet understanding divine things. Only pure faith and the Holy Spirit can aid the latter, but for the former the liberal arts are necessary, and here Erasmus differs from Abailard in his reliance on grammar rather than dialectic. Consequently he prefers the *Annotations on the New Testament* of Laurentius Valla to the theological commentaries of Nicholas of Lyra. *Epistola 182 to Christopher Fisher;* Allen I, 410: "An dicent non idem esse iuris Vallae grammatico quod Nicolao theologo? Ut ne respondeam interim Laurentium a magnis viris inter philosophos quoque ac theologos referri, Lyra quum vocem excutit, num theologi ac non magis grammatici vices agit? imo totum hoc, diuinas vertere scripturas, grammatici videlicet partes sunt. Neque vero absurdum si quibusdam in rebus plus sapit Iethro quam Moyses. Ac ne ipsa quidem, opinor, disciplinarum omnium regina theologia ducet indignum admoueri sibi manus, ac debitum exhiberi obsequium a pedissequa grammatica; quae tametsi nonnullis est dignitate posterior, nullius certe opera magis necessaria. In minimis versatur, sed sine quibus nemo euasit maximus; nugas agitat, sed quae seria ducant. Quod si reclament maiorem esse theologiam quam ut grammaticae legibus teneatur, totum interpretandi negocium de sacri Spiritus afflatu pendere, noua vero theologorum dignitas, si solis illis licet barbare loqui. Sed expediant interim quid sibi velit, quod Desyderio suo scribit Hieronymus, Aliud est, inquiens, esse vatem et aliud interpretem. Ibi Spiritus ventura praedicit; hic eruditio et verborum copia quae intelligit transfert."

There is a third form that grammar is to take in the hands of rhetoricians who submit grammar and dialectic to the needs of their art: for them, grammar means what it has come to mean most commonly today; it consists only in the rules of correct speech,[53] for the task of the rhetorician is to state his doctrine so clearly and persuasively that there is no need of a further grammatical art to make his meaning clear. Abailard and Erasmus can therefore both cite the *De doctrina Christiana* of Augustine in support of their positions. For Abailard it is a defense of the disciplines prepared by the pagan philosophers and particularly the chief of them, dialectic, which Augustine had called the art of arts; what is important is science and that Abailard conceives in its systematic, formal, logical sense. For Erasmus the same work is a defense of sciences, but to Erasmus, the sciences were bodies of information, to be culled as they are useful; dialectic is one among them, the art of arts, to be sure, but of slight utility in the discovery of truth and worse than useless in the interpretation of Scripture. The formal structure of science, whatever its utility to one engaged in disputation, may be ignored by one who seeks a guide to action. Parallel with this extension of the scope of grammar, dialectic underwent a restriction. Medieval philosophers had brought together the two meanings which the term had had in antiquity. According to Plato, dialectic consisted in the pursuit of reality by the use of reason alone, independent of all sensuous information, until by an act of pure intelligence the true nature of the good had

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See also Erasmus's preface to Valla's *Annotations* and E. F. H. Capey's *Erasmus*, London 1905, pp. 104-6. Luther becomes the pure grammarian by assimilating the two pursuits to one and putting his whole confidence in the Holy Spirit alone.

[53] See the treatment of grammar by Nizolius, below, page 107.

been grasped;[54] the mark of the dialectician was the ability to survey a subject as a whole.[55] According to Aristotle, dialectic was one of the three kinds of reasoning or syllogism: unlike the demonstrative syllogism, which depends on primary and true premises, and the eristic or sophistic syllogism, which depends on premises which seem to be probable but are not, or which seem to depend on premises which are or seem to be probable, the dialectical syllogism is concluded from premises which are probable, that is, such as are accepted by all or by most men or by the wise.[56] Dur-

[54] *Republic* VII, 532.

[55] *Ibid.*, 537. Among the Platonists dialectic became connected inseparably with the dialogue form of discourse. Cf. Diogenes Laertius, *Lives of Eminent Philosophers* III, 48, trans. R. D. Hicks, New York, 1925, p. 319: "Dialectic is the art of discourse by which we either refute or establish some proposition by means of question and answer on the part of the interlocutors."

[56] *Topics*, I. 1, 100a 25–100b 26: *Ἔστι δὴ συλλογισμὸς λόγος ἐν ᾧ τεθέντων τινῶν ἕτερόν τι τῶν κειμένων ἐξ ἀνάγκης συμβαίνει διὰ τῶν κειμένων· ἀπόδειξις μὲν οὖν ἐστίν, ὅταν ἐξ ἀληθῶν καὶ πρώτων ὁ συλλογισμὸς ᾖ, ἢ ἐκ τοιούτων ἃ διά τινων πρώτων καὶ ἀληθῶν τῆς περὶ αὐτὰ γνώσεως τὴν ἀρχὴν εἴληφεν· διαλεκτικὸς δὲ συλλογισμὸς ὁ ἐξ ἐνδόξων συλλογιζόμενος. ἔστι δὲ ἀληθῆ μὲν καὶ πρῶτα τὰ μὴ δι' ἑτέρων ἀλλὰ δι' αὑτῶν ἔχοντα τὴν πίστιν· οὐ δεῖ γὰρ ἐν ταῖς ἐπιστημονικαῖς ἀρχαῖς ἐπιζητεῖσθαι τὸ διὰ τί, ἀλλ' ἑκάστην τῶν ἀρχῶν αὐτὴν καθ' ἑαυτὴν εἶναι πιστήν. ἔνδοξα δὲ τὰ δοκοῦντα πᾶσιν ἢ τοῖς πλείστοις ἢ τοῖς σοφοῖς, καὶ τούτοις ἢ πᾶσιν ἢ τοῖς πλείστοις ἢ τοῖς μάλιστα γνωρίμοις καὶ ἐνδόξοις. ἐριστικὸς δ'ἐστὶ συλλογισμὸς ὁ ἐκ φαινομένων ἐνδόξων, μὴ ὄντων ὁἐ, καὶ ὁ ἐξ ἐνδόξων ἢ φαινομένων ἐνδόξων φαινόμενος.*

Cf. *Topics* I, 10, 104a3-104a15: "First, then, what a dialectical proposition is and what a dialectical problem is, must be defined, for it must not be thought that every proposition or every problem is dialectical. For no one in his senses would state as a proposition something which no one accepts or set as a problem what is manifest to all or to most people, for the latter admits of no doubt, and the former no one would concede. But a dialectical proposition is an interrogation which is probable to all or to most men or to the wise, and of the wise, either to all or to most or to the most famous, provided it is not contrary to common opinion; for any one would admit easily what is held by the wise, so long as it is not contrary to the opinions of most men. Dialectical propositions are likewise those which are similar to probable propositions; also propositions which contradict the contraries to those which seem to be probable, and also whatever opinions there are concerning the discovered arts."

ing the early Middle Ages, however, both conceptions of dialectic were known only at secondhand, for of all Plato's dialogues only a portion of the *Timaeus* had been translated and of Aristotle only the first two books of the *Organon*. Until the twelfth century, therefore, dialectic and logic were interchangeable names applied to the third of the three arts, and when Abailard wrote a work on logic and borrowed the titles for its parts from the divisions of Aristotle's logical work, that work was entitled *Dialectica*.[57] In it there is no treatment of probable arguments as such: the *Topics* is concerned with hypothetical propositions and is followed by the *Posterior Analytics* in which hypothetical syllogisms are treated. Yet within Abailard's lifetime the Aristotelian distinction of demonstrative, dialec-

[57] Cf. Abailardus, "Glossae super Porphyrium," edited by Dr. B. Geyer in *Beiträge zur Geschichte der Philosophie des Mittelälters*, XXI, 2: "In scribendo autem *logicam* hic ordo necessarius est, ut quoniam argumentationes ex propositionibus iunguntur, propositiones (ex) dictionibus, eum qui logicam perfecte scribit, primum de simplicibus sermonibus, deinde de propositionibus necesse est scribere, tandem in argumentationibus finem logicae consummare, sicut et princeps noster Aristoteles fecit, qui ad sermonum doctrinam Praedicamenta perscripsit, ad propositionum Peri ermeneias, ad argumentationum Topica et Analytica. Iste autem Porphyrius sicut ipsa inscriptio tituli docet, hanc introductionem ad Praedicamenta Aristotelis praeparat, quam tamen ipse ad totam artem necessariam posterius demonstrat. Cuius intentio, materia, modus tractandi, utilitas aut cui *dialecticae* parti supponatur praesens scientia, breviter distinguatur subtilius." Also 3-4: "Quidam tamen hanc scientiam nec non praedicamentorum aut divisionum seu definitionum vel etiam propositionum omnino ab inventione et iudicio separant nec ullo modo in partibus *logicae* recipiunt, cum tamen eas ad totam logicam necessarias iudicent. Quibus quidem tam auctoritas quam (ratio) contraria videtur. Boethius namque super Topica Ciceronis duplicem divisionem *dialecticae* ponit, quarum utraque ita alteram vicissim includit, ut singulae totam dialecticam comprehendant. Prima quidem est per scientiam inveniendi et iudicandi, secunda per scientiam dividendi, definiendi, colligendi." Cf. *Glossae super praedicamenta Aristotelis*, ibid. 114: "Omnis namque logica duas habet partes intergrales nec alias habere invenitur, scientiam scilicet inveniendi argumenta et diiudicandi, id est comprobandi, inventa."

tical and sophistical syllogisms was once more made, though dialectic continued to be used loosely as the synonym of logic.[58] Indeed in the twelfth century "dialectician" seems to have been used as the synonym not only for "logician" in the Aristotelian sense but for "peripatetic" in general.[59]

[58] Thus John of Salisbury, *Metalogicon* II, 3, ed. by Clement C. J. Webb, Oxford, 1929, 64-65: "Qui vero sine logica philosophiam doceri putat, idem a sapientie cultu omnium rerum exterminet rationes, quoniam eis logica presidet. Ut diuertamus ad fabulas, Fronesim sororem Alicie, nec sterilem reputauit antiquitas, sed eggregiam eius sobolem castis Mercurii iunxit amplexibus; est enim soror ueritatis prudentia, et amorem rationis et scientie per eloquentiam fecundat et illustrat. Siquidem hoc est Philologiam Mercurio copulari; pro eo namque logica dicta est, quod rationalis, id est rationum ministratoria et examinatrix est. Diuisit eam Plato in dialecticam et rethoricam; sed qui efficaciam eius altius metiuntur, ei plura attribuunt. Siquidem ei demonstratiua, probabilis, et sophistica subiciuntur, sed demonstratiua a disciplinalibus uiget principiis et ad eorum consecutiua progreditur, necessitate gaudet, et quid cui uideatur, dum tamen ita esse oporteat, non multum attendit. Decet hoc philosophicam recte docentium maiestatem, que suo citra auditorum assensum roboratur arbitrio. Probabilis autem uersatur in his que uidentur omnibus aut pluribus aut sapientibus; et his uel omnibus uel pluribus uel maxime notis et probabilibus aut consecutiuis eorum. Hec quidem dialectecticam et rethoricam continet; quoniam dialecticus et orator persuadere nitentes, alter aduersario, alter iudici, non multum referre arbitrantur, uera an falsa sint argumenta eorum, dummodo ueri similitudinem teneant." Also II, 5, 68: "Philosophus autem, demonstrativa utens, negotiatur ad veritatem; dialecticus ad opinionem, siquidem probabilitate contentus est. Sophiste autem sufficit, si vel videatur esse probabile." Thus the *Summulae logicales* of Peter of Spain, one of the first of the textbooks on logic to contain a résumé of the whole Aristotelian analysis, refers to the subject throughout as dialectic, and opens indeed with a definition of dialectic which traces its ancestry at least back to the Pseudo-Augustine. "Dialectica est ars artium, scientia scientiarum ad omnium methodorum principia viam habens." Erasmus had studied logic in that book, which he calls the *Dialectic* of Peter of Spain. "Nam et satis erant grammatici et Petri Hispani Dialecticam magne ex parte didicerant." Epistola 447 to Lambertus Grunnius, Allen II, 295.

[59] Abailardus, *Theologia Christiana* III, PL 178, 1213: "Scimus quidem a Peripateticis, quos nunc dialecticos appellamus." John of Salisbury, *Metalogicon* II, 20, 116: "sed ei qui Peripateticorum libros aggreditur, magis Aristotelis sententia sequenda est; forte non quia verior, sed plane quia his disciplinis magis accommoda est."

When Erasmus, more than three hundred and fifty years later, attacks dialectic and logic, his criticism is directed against the study and search for syllogisms, and the attack on syllogisms is equivalent to an attack on disputation. Dialectic had indeed been defined, in the Aristotelian tradition, as the science of disputing well,[60] but in that tradition dialectic was not the whole of logic, nor indeed the most important part, for it did not consider the demonstrative arguments of science. In Erasmus's refutation, therefore, logic in the broad sense is reduced to dialectic in the narrow sense. This is equivalent to treating all arguments as probable arguments and to looking for the cogency of science not in the principles on which the propositions of science depend and the demonstration by which they are derived from those principles, but rather in the adequacy of its mirroring of nature, which in turn is to be judged by its utility and by the consequences of using it as a guide to action. When the peripatetic method of scholasticism has been thus refuted, what is left of dialectic and argumentation is in the Platonic mode; Erasmus used the dialogue form effectively in the *Colloquies* and in the *Ciceronianus* and even contemplated the use of it in interpretation of the Scriptures.[61]

That shift in the emphasis in the three arts, that subversion of dialectic to grammar, is in itself sufficient to account for the changes which the Renaissance is reputed to have made. Ancient letters are rediscovered: Erasmus talks constantly of the bond between theology and good letters, *bonae literae,* and of the opposition of theologians to the introduction and study of good letters, since that would

[60] Pseudo-Augustine, *De dialectica,* I, PL 32, 1409: "Dialectica est bene disputandi scientia." Cf. John of Salisbury, *Metalogicon* II, 4, 65.

[61] Cf. A. Humbert, *Les Origines de la théologie moderne,* Paris 1911, I, 190 ff.

reveal the ignorance of theologians. He labored to facilitate the study of the reconstituted complete texts of Church Fathers and of pagans, whereas the medieval philosopher had dealt with the doctrines of past philosophers in brief passages or texts grouped according to the subjects they treated. Man is rediscovered, both the man of antiquity who wrote and the present-day man who reads, for, on the one hand, in the constitution and criticism of texts, questions of authenticity, of the personal traits of authors and of their differences one from the other, assume an importance which they never had for the medieval philosopher (since for him an argument, once understood, had the same weight whatever its origin) and, on the other hand, the perception and mind of the reader, similarly individualized, activated as the spirit moves, is the concern of the theologian rather than impersonal arguments which are valid though most of mankind be insensible to them. The concern of the philosopher has become practical: according to Erasmus, unlike the philosophies which sought difficult problems on which to exercise their disciplines, the philosophy of Christ deals in precepts intelligible to all, of which the Holy Spirit is the Doctor, and simple and pure faith the only requisite; it accommodates itself to all, it is not absent from the lowest, it is still admirable to the highest; it passes by no age, no sex, no fortune, no condition; not even the sun is more common and exposed to all than the doctrine of Christ.[62]

[62] *Paraclesis,* Opera V, 139 F-140 C: "Praesertim cum hoc sapientiae genus, tam eximium, ut semel stultam reddiderit universam hujus mundi sapientiam, ex paucis hisce libris, velut e limpidissimis fontibus, haurire liceat, longe minore negotio, quam ex tot voluminibus spinosis, ex tam immensis, iisque inter se pugnantibus Interpretum commentariis, Aristotelicam doctrinam, ut ne addam, quanto majore cum fructu. Nihil enim hic necesse est, ut tot anxiis disciplinis instructus accedas. Simplex & cuivis paratum est viaticum, tantum fac adferas pium ac promptum animum, & inprimis simplici puraque praeditum

Finally, nature is discovered, for the term nature has taken on a new meaning and consequent importance: the sciences, theology, philosophy and the others, had been ordered in terms of what is most intelligible; with the disrepute of logic, the tendency grows to orient practice in terms of what is natural. The wise man is no longer the arbiter of theology; on the contrary, the doctrines of theology are those within the scope of all, those which are most natural. Man, nature and intellectual freedom are what the historian has seen of the grammatical side of the debate of the grammarian with the dialectician.

This fight for "the cause of languages and good letters," which brought him criticism at each step for having cor-

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fide. Tantum esto docilis, & multum in hac Philosophia promovisti. Ipsa suppeditat doctorem Spiritum, qui nulli sese lubentius impertit, quam simplicibus animis. Illorum disciplinae, praeterquam quod falsam promittunt felicitatem, multorum ingenia submovent, ipsa, videlicet, praeceptorum difficultate. Haec omnibus ex aequo sese accommodat, submittit se parvulis, ad illorum modulum sese attemperat, lacte illos alens, ferens, confovens, sustinens, omnia faciens, donec grandescamus in Christo. At rursum ita non deest infimis, ut summis etiam sit admirabilis. Imo quo longius in hujus opes progressus fueris, hoc longius illius majestate submoveris. Parvis pusilla est, magnis plus quam maxima. Nullam haec aetatem, nullum sexum, nullam fortunam, nullam rejicit conditionem. Sol hic non perinde communis & expositus est omnibus atque Christi doctrina. Non arcet omnino quemquam, nisi quis semet arceat, ipse sibi invidens. Vehementer enim ab istis dissentio, qui nolint ab idiotis legi Divinas litteras, in vulgi linguam transfusas, sive quasi Christus tam involuta docuerit, ut vix a pauculis Theologis posint intelligi, sive quasi Religionis Christianae praesidium in hoc situm sit, si nesciatur. Regum mysteria celare fortasse satius est: At Christus sua mysteria quam maxime cupit evulgari. Optarem ut omnes mulierculae legant Euangelium, legant Paulinas Epistolas." Cf. *Enchiridon militis Christiani* 2, Opera V, 8 F: "Neque vero hoc dixerim, quod neotericos contemnam, sed quod utiliora praeferam tuoque proposito conducibiliora. Habet autem Spiritus ille Divinus suam quamdam linguam suasque figuras, quae tibi sunt in primis diligenti observatione cognoscendae. Balbutit nobis Divina sapientia, et veluti mater quaepiam officiosa, ad nostram infantiam voces accommodat."

rupted the simple style of Jerome with rhetorical adornments, for having ventured to retranslate the New Testament, to correct the Magnificat, to tamper with the Lord's Prayer, to change the Gospel of John, is inseparable from the theology of Erasmus,[63] for the only task of the philosophy of Christ is to make the words of Christ intelligible to all, that his precepts may be followed by all. No treatise on technical philosophy would have been in place in the program Erasmus set for initiation in the true theology, but the sequence of his scholarly labors is the perfect statement of his contribution to philosophy: the publication of texts of the New Testament and the Fathers. He edited the Greek New Testament, made a new translation of it into Latin, prepared paraphrases and notes for it and wrote commentaries on ten of the Psalms; he prepared an edition of Jerome with notes (in nine folio volumes), editions of Cyprian, Arnobius, Irenaeus, Ambrose, Augustine (in ten folio volumes), treatises by Lactantius, Chrysostom, Alger of Liège, the commentary of Haymo of Halberstadt on the

[63] "Epistle 1805 to John Maldonatus," *Opus epistolarum Des. Erasmi Roterodami*, ed. P. S. Allen and H. M. Allen, Oxford 1928, vol. VII, 15: Nec tamen in aliud faui litteris humanioribus nisi ut famularentur grauioribus disciplinis, et in his precipue theologiae, quod viderem ex harum neglectu natam miserabilem omnium disciplinarum corruptionem, autorum probatissimorum vel interitum vel deprauationem, vix ipsis reparabilem qui scripserunt. . . . Ubi prodissent opera diui Hieronymi, persuaserunt nonnullis etiam principibus me simplicem Hieronymi stilum ornasse fucis rhetoricis. Ubi Nouum Testamentum exisset in lucem, tum vero lymphatorum ritu publicitus ad lapidandum Erasmum prouocabant imperitam multitudinem: hominem temerarium qui corrigeret canticum Magnificat, qui castigaret Praecationem Dominicam, qui mutaret Euangelium Ioannis. Et tamen huiusmodi clamoribus tam stolidis magis suam in(s)citiam cum pari malitia coniunctam traduxerunt quam meam existimationem laeserunt." The *Epistola apologetica ad Martinum Borpium Theologum*, Opera IX, 2 ff, was written as a reply to a critic who, though approving of Erasmus's edition of Jerome, was horrified by his *Praise of Folly* and his edition of the New Testament.

Psalms; at the time of his death he was at work on a Latin edition of Origen. His scholarly labors among the pagan classics were no less extensive, though less laboriously conceived, since they were incidental to his work as a theological scholar: Greek editions of Aristotle and Demosthenes, Latin editions of Seneca, Quintus Curtius, Suetonius, Pliny the Elder, Livy, Terence; treatises by Cicero, translations from Plutarch, Galen and Xenophon. Besides these must be reckoned his own works and his multitudinous letters, many of which are devoted to making clear his stand with respect to scholastic and the true theology. It is in this light that his correspondent, Urban Regius, views him as "the first author of the renaissance of theology in our times,"[64] the first to call theologians back from the turbid lacunae of scholasticism to the fount of sacred letters.

First of all you urged us to the ancient theologians, from which rivulets you then led us to the canonical Scriptures, the most limpid fountain, finally you brought it about by your most learned vigils alone that almost no kind of studies now proceeds on a better footing than does sacrosanct theology. We see a thing truly admirable, that human and sacred letters are so connected that studies which had been more than enemies before the machinations of unlearned men may now be learned together without disturbance. All this we owe to your lucubrations who have moved every stone that the celestial philosophy of the cross might at last be learned in the schools of theologians in the place of inane philosophy. Rejoice and triumph, Erasmus; it has begun to be known not only among the learned in letters, but among the lay, who have been persuaded by your *Paraclesis,* that sacred letters are the property of all Christians. A short while ago I heard a matron expatiate concerning the Law and the Gospel from the Epistle of Paul to the Romans much more learnedly than those great Masters of ours could

[64] "Epistle 1253 from Urban Regius," *Opus epistolarum,* Allen V, 2.

have done formerly. Thus you have aroused as by a trumpet all the world to the philosophy of Christ.

The new philosophy was to be based on and checked against the careful study of the text of the New Testament, for it consisted in the methodical discovery of the literal meaning and then of figurative meanings of that document. It was not a philosophy in the sense of a mass or system of doctrines which can be attributed to Erasmus or to the ultimate author to whom he ascribed it, Christ. The truth or falsity of such theological doctrines does not even concern Erasmus: he is struck rather by their infecundity and their inelegance, the subtleties, sophisms and syllogisms that go on endlessly, the meaningless questions that are propounded.[65] The medieval theologian had tried to organize

[65] In his notes on the New Testament, Erasmus finds the opportunity in commenting on the word "vaniloquim," "vain talking," in Paul's Epistle to Timothy, I: 6, "But the end of the charge is love out of a pure heart and a good conscience and faith unfeigned: from which things some having swerved have turned aside unto vain talking," to draw up an imposing list of the insoluble problems that have occupied theologians, interrupted only by the statement of the contrast between the true theology and this caviling theology. *Opera* VI, 926 D-E: "Proinde nobis quoque cavendum est, ne sic sectemur Theologiam, ut in mataeologiam incidamus de frivolis nugis sine fine digladiantes. Ea potius tractemus, quae nos transforment in Christum, & coelo dignos reddant. Quorsum enim attinet decertare, quotmodis accipiatur peccatum, privatio duntaxat sit, an macula inhaerens animae? Hoc potius agat Theologus, ut omnes horreant oderintque peccatum. Totis seculis disputamus, an gratia, qua Deus nos diligit ac trahit, & qua nos illum vicissim diligimus, eadem sit gratia, & an sit aliquid creatum an increatum. Illud potius agamus, puris precibus, innocentia vitae, piis factis, ut eo munere nos dignetur Deus. Digladiamur sine fine, quid distinguat Patrem a Filio, & utrumque a Spiritu sancto, res, an relatio, & qui consistat, tres dici, quorum nullus sit qui alius, cum sint una essentia." Again, *ibid.*, 927E-28: "Et tamen hujusmodi quaestiunculis serio occupantur quorumdam Theologorum Scholae. His aetas rerum omnium fugacissima conteritur, cum pleraque sint ejus generis, ut doctius nesciantur quam sciantur, ut ridicule quaerantur, temere definiantur. Breve tempus est, & arduum est negotium agere vere Christianum. Quin

a body of doctrine, point by point, based on a body of texts derived from Scriptures and Church Fathers; the new theologian returned to the text of the Scripture itself and its direct interpretation. The new emphasis, therefore, was upon the document and the writer, rather than upon the doctrine and the tradition. The approach was to be direct and

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igitur omissis rebus supervacaneis, ea potissimum spectamus, quae Christus nos scire voluit, quae prodiderunt Apostoli, quae proprie ad charitatem faciunt, de corde puro, & conscientia bona, & fide non ficta, quam unam Paulus appellat finem & perfectionem totius Legis. Tot jam annis cavillamur in Scholis, quibus verbis sit loquendum de Christo. . . . Et in hac Theologia tam non simplici vitam omnem consumunt, qui simplicem & Apostolicam profitentur. Et qui ipso etiam cognomine summam modestiam profitentur, hujusmodi philosophiae professione tollunt cristas. Qui congruit Apostolicae vitae professio cum Ethnicae philosophiae tanto tamque curioso studio? Os consecratum est Evangelio, & nihil crepat nisi Averroem & Aristotelem. Horretur pecuniae contactus, & in blasphemi Philosophi libris tota ducitur aetas. Veteres, qui in Paganismo aut per aetatis inscitiam talia didicerant, ex his quaedam decerpebant ad eruditionem Christianam. Nunc qui Christi simplicitatem profitentur & aluntur praedicando Evangelio, talia coguntur perdiscere. Novi quemdam Theologum, qui negabat annos novem sufficere ad intelligenda quae Scotus scripsit tantum in praefationem Petri Lombardi. Audivi rursus alium, qui praedicabat fieri non posse, ut quis intelligeret unam propositionem in toto Scoto, nisi metaphysicam ipsius universam teneret memoria. Hujusmodi labyrinthis Basilides, Valentinus, & Marcion captabant animos simplicium. Denique fingamus haec esse frugifera, quanta hic occurrit opinionum pugna? Fingamus rursus omnia convenire, quam multa frustra quaeruntur, quam multa temere definiuntur? Et praetexunt has argutias ad revincendos Ethnicos & Haereticos esse necessarias: quum illa nusquam sint usui, nisi inter ejusdem Scholae sodales. Non haec eo spectant, ut suadeam esse damnandam Dialecticam ac Philosophiam, quae traduntur in Scholis, immodicum in frivolis studium improbo." Cf. the similar diatribe against the abuses of scholastic philosophy contained in the note to Matthew 11: 30, "For my yoke is easy, and my burden is light." *Ibid.*, 63-64: "Vere blandum est jugum Christi, & levis farcina, si praeter id, quod ille nobis imposuit, nihil imponeretur ab humanis constitutiumculis. Praeter mutuam charitatem nihil ille praecipit: neque quicquam tam amarum est, quod non condiat condulcetque charitas. Facile toleratur, quicquid est secundum naturam. Nihil autem magis congruit cum hominis natura, quam Christi philosophia, quae pene nihil aliud agit,

dependent on perception, rather than argumentative and dependent on reason; between interpreter and writer no human intermediary was needed.[66] The Bible, consequently,

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quam ut naturam collapsam suae restituat innocentiae sinceritatique. Sed quemadmodum apud Judaeos legem per se molestam aggravabant hominum constitutiones, ita cavendum est etiam atque etiam, ne Christi legem per se blandam ac levem, gravem & asperam reddant humanarum constitutionum ac dogmatum accessiones. . . . Sunt qui nectant nobis frigidum syllogismum, & ex loco parum intellecto, aut ex hominis constitutiuncula pariunt Articulum fidei. Atque ex his Christiani aut non Christiani censemur, quae ne tantulum quidem Christianam attinent pietatem. Jam quam popularis, quam expedita est doctrina Christi, Apostolica, & Patrum Apostolicorum, quam nunc impedita, spinosa, ne dicam tenebricosa facta, partim admixtu legum ac disciplinarum humanarum, partim somniis & inventiunculis ambitiosorum hominum, posteaquam sacrae Theologiae professio scenica quaedam ac theatrica res esse coepit. Tota hominis aetas non sufficit quaestiunculis & inutilium argutiarum labyrinthis.''

[66] *The Praise of Folly*, translated by J. Wilson, Oxford 1925, 117-118: ''And these most subtile subtilties are rendred yet more subtile by the several Methods of so many Schoolmen, that one might sooner wind himself out of a Labyrinth than the entanglements of the Realists, Nominalists, Thomists, Albertists, Occamists, Scotists. Nor have I nam'd all the several Sects, but onely some of the chief; in all which there is so much Doctrine and so much difficultie, that I may well conceive the Apostles, had they been to deal with these new kind of Divines, had needed to have pray'd in aid of some other Spirit. Paul knew what Faith was, and yet when he saith, 'Faith is the Substance of things hop'd for, and the Evidence of things not seen,' he did not define it Doctor-like. And as he understood Charity well himself, so he did as Illogically divide and define it to others in his first Epistle to the Corinthians, Chapter the thirteenth. And devoutly, no doubt, did the Apostles consecrate the Eucharist; yet, had they been askt the question touching the 'Terminus a quo' and the 'Terminus ad quem' of Transubstantiation; of the manner how the same body can be in several places at one and the same time; of the difference the body of Christ has in Heaven from that of the Cross, or this in the Sacrament; in what punct of time Transubstantiation is, whereas Prayer, by means of which it is, as being a discrete quantity, is transient; they would not, I conceive, have answer'd with the same subtility as the Scotists Dispute and Define it. They knew the Mother of Jesus; but which of them has so Philosophically demonstrated how she was preserv'd from Original sin, as have done our Divines?''

which had presented a homogeneous doctrine, continuous indeed with pagans before and theologians later, was seen now as the work of a succession of writers; the characteristics and marks of each could be detected and their relative importance estimated, and among them outstanding personalities were to emerge—Moses, Isaiah, John, Paul. The Book of Genesis which had been a physics and a metaphysics was to become a poem; the Epistles of Paul which had been the source of a dogmatic theology were to be read for rules of life and action. Some intermediary was still needed, to be sure, for the understanding of the document, to supply as it were the rules of the grammar; Erasmus chose Jerome; Luther, Augustine; Reuchlin, the Caballists; Lefèvre d'Etaple, the Pseudo-Dionysius; and so each of the figures of the new learning approached nature and religion with the aid of some ancient writer. But what was sought was light rather than doctrine, love rather than knowledge, letter rather than principle. The new learning was concerned with good letters, and reformers, tired of the syllogisms of centuries of philosophers, became scholars to study earlier documents and to appreciate them as histories, poems and examples.

IV

Controversies, however, did not go out of the world with the growing enthusiasm for the new learning and contempt for dialectic. What had been a difference of reasons and arguments became a difference of men and temperaments: when syllogisms were abandoned for simple faith, it was difficult, as Abailard had seen, to weigh the faith of one man against that of another. So Luther was at one with Erasmus in his opposition to scholastic philosophy with its infiltration of dialectic, of human philosophy and human law, but ultimately to Erasmus, Luther was an enemy of good letters,

and to Luther, Erasmus was ignorant of the fundamental truths of the Bible. Like Erasmus, Luther was dismayed at the neglect into which the study of the Bible had fallen. When he was a monk he had found that the Bible was despised: no one understood the Psalms and it was thought that the Epistle of Paul to the Romans was to be considered in terms of Paul's times, but was of no use to the current century. Instead, Scotus, Thomas and Aristotle were read.[67] Luther speaks of Aristotle as a rancid philosopher[68] and is convinced that his doctrines are in contradiction to the Catholic truth.[69] When Paul cautions us against "philosophy and vain deceit," Luther is confident the warning must be interpreted to apply to scholastic philosophy, and the specification that it is "after the traditions of men and after the rudiments of the world,"[70] is specification of the law of bulls and canons.[71] Scholastic theology is nothing but an ignorance of truth and a scandal set upon the Scriptures.[72]

The common enemy is scholastic philosophy based on commentaries on the *Book of Sentences* and contaminated by dialectic. Luther's relations to his former teachers, Isennach and Usingen, and his criticism of the courses they offered and of their works, indicate the bitterness of his resentment of the errors of dialecticians no less than their amazement at his position. He wrote to John Lang, Prior of the Augustinian Hermits at Erfurt, in 1517:

I am sending you this letter of mine to the excellent Master Jodocus Isennach, full of questions against logic, philosophy and theology, that is, of blasphemies and maledictions

[67] O. Scheel, *Dokumente zu Luthers Entwicklung*, 2nd ed., Tübingen, 1929. Text 433, p. 158.
[68] Scheel, Text 561, p. 221.
[69] Scheel, Text 556, p. 220.
[70] Col. 2:8.
[71] Scheel, Text 41, p. 19.
[72] Scheel, Text 39, p. 18.

against Aristotle, Porphyry and the Sententiaries [the commentators on the *Book of Sentences* of Peter Lombard], the accursed studies of our age. For so it will be interpreted by those who have vowed, not for five years like the Pythagoreans, but perpetually and eternally to keep silent as the dead, to believe all things, to listen always, and never, not even in jest, to skirmish or to grumble against Aristotle or the Sentences. For why should not they, who have faith in Aristotle, believe to be true those things which he himself, the most calumnious of calumniators, attributes and imposes on others, so absurd that an ass or a stone could not hold their peace at them? . . . But the greatest sorrow to me is that I am obliged to see the best genius of our brother monks, suited to be applied to good studies, spend its life and lose its work on such tales; nor do the Universities cease to burn and condemn good books, and then dictate or rather dream bad ones. I wish that Master Usingen together with Isennach, would abstain, or rather contain himself, for a while from these labors. My closets are all filled with writings against their publications, which I am convinced are worse than useless; and all others would see this, if they were not, as I have said, restrained under a perpetual oath of silence.[73]

When another correspondent asks him to show in what places logic is necessary to theology, his answer[74] is that he does not think dialectic is necessary to theology in any place, since Christ has no need of human figments, defending his position with scriptural quotations: the science of man and the wisdom of this world are made foolishness with God;[75] take heed lest there shall be anyone that maketh sport of you through his vain deceit;[76] all sophistry is hateful to God.[77] Not that he would extinguish dialectic entirely, but

[73] "Brief 34, Luther an Joh. Lang in Erfurt," D. Martin, *Luthers Werke, Briefwecksel* I, Weimar, 1930, 88-89.
[74] "Brief 59, Luther an Spalatin," *Briefwechsel* I, 143.
[75] I Cor. 3:19.
[76] Col. 2:8.
[77] Ecclesiasticus 37:23.

that the dialectical books set up superfluous commotions and where one book would suffice for knowing dialectic there are ten. Again,

You ask how far I think dialectic is useful to the theologian. I absolutely do not see how dialectic can be other than a poison to a true theologian. Grant that it may be useful as a game or an exercise for youthful minds, still in sacred letters, where pure faith and divine illumination are expected, the whole matter of the syllogism must be left without, just as Abraham, when about to sacrifice, left the boys with the asses. This, John Reuchlin in the second book of his Caballa affirms sufficiently. For if any dialectic is necessary, that natural inborn dialectic is sufficient, by which a man is led to compare beliefs with other beliefs and so conclude the truth. I have often discussed with friends what utility seemed to us to be gained from this so sedulous study of philosophy and dialectic, and truly with one consent, having marvelled at, or rather bewailed, the calamity of our minds, we found no utility, but rather a whole sea of hindrance. Finally, I have written to Master Isennach, the prince of the dialecticians of our age (as it seems), concerning the same thing, insisting most strongly on this, which cannot be denied, that dialectic can not help theology but rather hinders it, for this reason, that theology uses the same grammatical terms entirely differently from dialectic. How then, I say, can dialectic be of any use, since, after I have come to theology I am compelled to reject that meaning of the word which it had in dialectic and take another meaning of it? . . . The man was very much displeased and asserted that my sophistical reasons could not be accredited even by myself. But these men are the bondsmen of Aristotle and Porphyry, nor do they consider what those two say, but that they say it. Hence it comes about that they are not able to grasp the meaning of one single chapter of Scripture much less convey that meaning to another. If therefore you credit my judgment, of whatever use dialectic be to you in any subject in which it can have use, it will only do harm in theology. I myself have observed the doc-

trines and rules of scholastic theology, and I have purposefully tried to treat the sacred writings and those of the Church fathers in accordance with them, but (may God condemn me if I lie) I was horrified by the confusion greater than that of Tartarus. I have seen then of what use studies of this sort should be. But I will try the same thing sometime with you when we shall be together and I shall have you experience what you now hear.[78]

Luther is not unaware that by refusing a place to logic in the sacred science, he renders his position impregnable to logical argumentation. He reports that Doctor Isennach as a sign of his disapproval of Luther's theology, which was, Luther writes, death twice recooked to the Erfurtians, marked his theses with a black theta and argued that he was an ignoramus not only in dialectic but in theology.

I had however [he goes on] a private conversation with Doctor Isennach, and if I accomplished nothing more, I at least made him understand that he could not prove his position, nor confute mine; indeed that their opinions were that beast which it is said would devour itself. But the fable is told in vain to a deaf man. They stick obstinately to their little distinctions, even if they confess that the distinctions are established on no authority, except what they call the dictate of natural reason, which to us who preach no other light than Jesus Christ, the true and only light, is a chaos of darkness. With Doctor Usingen I strove much more than with all the others to persuade him (for he was my companion in the carriage), but I do not know whether I made any progress. I left him in thought and wonderment. So great a thing is it to have grown old in evil opinions. But the minds of all the young perceive diametrically differently from these, and my hope is great that as Christ turned to the Gentiles when he had been rejected by the Jews, so now his true theology, which these opinionative old men reject, may transfer itself to the young.[79]

[78] "Brief 61, Luther an Spalatin," *Briefwechsel* I, 149-50.
[79] "Brief 75, Luther an Spalatin," *Briefwechsel* I, 173-74.

A little more than a year later he affixes as postscript to a letter to the same correspondent the news of Isennach's death.

This very hour I heard from my friend Lucas [Cranach] the painter that Master Doctor Judocus Isennach of Erfurt has passed from among the living. I fear that I was the cause of the acceleration of his death, so great was the sickness of his soul caused by my, as he said, profanations and temerities, by which he grieved incredibly that I should have despised scholastic theology.[80]

The ignorance of the scholastic theologian, however, not only prevents him from understanding the Bible; he is unable to understand even Aristotle. Luther, writing to a friend to urge him not to fear to appear ignorant, not to be impressed by titles, doctors, universities, masters, assures him that there is almost no scholastic theologian who understands a single chapter of the Gospels or the Bible, nor indeed a single chapter of the philosopher Aristotle.[81] Or again when on one occasion he had been trapped into a dispute with a little master of Thomistic philosophy, *Magisterculus Thomasterculus,* concerning the trifles of Aristotle and Thomas, he showed that neither Thomas nor any of the Thomists understood a single chapter in Aristotle and, to deflate the pride of this Thomist in the power of Thomistic erudition, asked him to define for him what it is to fulfill the commandments of God, a question which he knew no Thomist could answer.[82] Again, in 1518, advising with John Gunkel, Rector of the university, Luther effected a change in the course of studies: the course in Thomist physics was dropped and in its place was substituted a literal reading

[80] "Brief 181, Luther an Spalatin," *Briefwechsel* I, 407.
[81] "Brief 65, Luther an Joh. Sylvius Egranus in Zwickam," *Briefwechsel* I, 158.
[82] "Brief 135, Luther an Spalatin," *Briefwechsel* I, 301-2.

of Aristotle's physics to be conducted by the Rector himself, and for the course in Thomist logic was substituted a course on the *Metamorphoses* of Ovid, a change in the direction of humane letters. The Scotist philosophy and logic, together with the textual study of physics and logic, they think will suffice, until such time as the equally useless disputes of that sect fall into disrepute, and pure philosophy and theology and all the disciplines are sought again in their original fountains.[83]

Thomas and his method is the subject of Luther's constant satire; even the beatification of Thomas is subject for doubts on Luther's part;[84] and Scotus with his figments is insane.[85] Even Augustine, who is the true disputator of the Church, who is the greatest theologian who wrote after the Apostles, whom the monks should read instead of Scotus,[86] who disputes better and more truly on felicity than that weaver of fables, Aristotle, and all his frivolous commentators,[87] even he like the other Fathers who are to be numbered as the greatest theologians, falls into errors, disputes, defines nothing, disagrees with the other Fathers, twists the sense of the Scriptures.[88] Yet it is eventually with Augustine that Luther goes in his theology and separates himself from Erasmus from whom he had learned so much. He states his difference from Erasmus in terms of the relative importance to be given to the works of Jerome and Augustine, to the literal and figurative interpretation of the Scriptures: as much as Luther holds that Augustine is to be preferred to Jerome in the interpretation of Scriptures,

[83] "Brief 117, Luther an Spalatin," *Briefwechsel* I, 262.
[84] Scheel, Texts 40, 45, 234, pp. 18, 20, 90.
[85] Scheel, Text 179, p. 69.
[86] Scheel, Text 434, p. 158.
[87] Scheel, Text 553, p. 219.
[88] Scheel, Text 91, p. 37, n. 1.

so much Erasmus holds that Jerome is to be preferred to Augustine in all things. Jerome is dedicated to a literal interpretation, which is a death of understanding, but of which almost all commentaries since Augustine have been full.[89] Not that the Scriptures should be read for allegories: Luther writes that he too had been an artificer of allegories when he was a monk, until he had come in the Epistle of Paul to the Romans on some understanding of Christ. There he saw that allegories are not what Christ signified, but what Christ was. Up to that time he had allegorized all things, even cloaca; thereafter he thought only of histories, sought not allegories but spirit and faith. Among the sins of Origen and Jerome was that they had led men to seek only allegories: in the whole of Origen there is not one word concerning Christ.[90] Erasmus had protested against the scholastic theology that Christ had intended all men for salvation, not only the learned man or the philosopher. Luther, in turn, finds that the Christian doctrine is even simpler than Erasmus had thought: Erasmus relies still too much on human judgment, too little on grace; he forgets that all men are to be saved, not only the philologian.

I read our Erasmus, and my good will toward him grows less day by day, for it pleases him to censure, no less constantly than learnedly, and to condemn monks as well as priests for this inveterate and lethargic ignorance, but I fear that he is not concerned sufficiently with Christ and the grace of God, in which he is much more ignorant than Lefèvre d'Etaples: human learning prevails more in him than divine. Although I judge him reluctantly, none the less I go so far as to warn you not to read all things, but particularly not to accept without judgment. For the times are perilous today, and I consider that one is not a truly

[89] "Brief 27, Luther an Spalatin," *Briefwechsel* I, 70.
[90] Scheel, Text 251, p. 98.

wise Christian simply because one knows Greek and Hebrew, since even Saint Jerome with his five languages did not equal the monogloss of Augustine, although to Erasmus the case has seemed altogether different. But the opinion of one who attributes something to the judgment of man is different from that of one who knows nothing but the grace of God.[91]

These opinions of his concerning Erasmus he urges his correspondent to divulge to no one, for he has nothing but praise for Erasmus's labors in the interest of good letters and against those who are ignorant of them or hate them, and there are many who would seize on any occasion to calumniate good letters. Speaking as a grammarian, Luther acknowledges no one more erudite and ingenious than Erasmus, not even Jerome himself, the object of so much of Erasmus's praise; but as a theologian he finds many things in Erasmus completely alien to the knowledge of Christ.[92]

Between these two foes of dialectic, these two grammarians of the word of Christ, there is a sharp difference concerning the nature of grammar, which assumes in the eyes of Luther the aspects not of a dialectical controversy but rather of a historical recrudescence of the differences agitated in the letters of Jerome the translator and Augustine the commentator, between the erudite doctor and the doctor of grace. Abailard had handled this situation repeatedly: his method was to take two texts from the two Fathers, examine their meanings and most usually show that they were in agreement, or sometimes that one was correct, the other wrong. Erasmus had thrown in his lot with the method of Jerome: all important controversies can be determined by reference to the text of the Bible, and its meaning can be made clear only by the devices of the grammarian and

[91] "Brief 35, Luther an Joh. Lang in Erfurt," *Briefwechsel* I, 90.
[92] "Brief 57, Luther an Spalatin," *Briefwechsel* I, 133.

the philologian. But what is the alternative method to that of Erasmus which Luther derives from the inspiration of Augustine? Like Erasmus, he is concerned to penetrate the meaning of a text, but aided not by human devices but by the grace of God.

If however you wrest from me my plan of study, I shall, of course, as is most friendly, conceal nothing from you, provided only that you follow me not without judgment. First, this is most certain, that sacred letters cannot be apprehended by study or genius. Therefore the first duty is to begin with a prayer, such, that is, that you pray, if it pleases God that something be done through you for His glory, not for yours nor for that of any other man, that he concede to you most mercifully the true understanding of His words. For there is no master of divine words except the Author himself of his word. As he says, "And they shall all be taught of God."[93] It is necessary therefore that you despair entirely of your study no less than of your ability, and that you have confidence only in the true influx of the spirit. Then, having established this humble desperation, read the Bible in order from the beginning to the end, that you may seize in memory the simple history (which however I believe you have already long since done). To this Saint Jerome will be of great assistance as well in his letters as in his commentaries. But to the knowledge of Christ and of the grace of God (that is, to the more secret understanding of the spirit), Saint Augustine and Saint Ambrose seem to me to be far better conductors, especially since Saint Jerome seems to Origenize (that is Allegorize) too much. I say these things however notwithstanding the opinion of Erasmus, since you asked my opinion, not the opinion of Erasmus.[94]

Here the extreme of value is put upon uncertainty. This humble despair of all human powers is behind Luther's strictures against the scholastics for their too great con-

[93] John 6:45.
[94] "Brief 57, Luther an Spalatin," *Briefwechsel* I, 133-34.

fidence in reason: no reason of man can be taken as certain, for the wisdom of the world is made stupid by God: no action can be taken as certainly good, for even too great aspiration to purity defeats itself, since Christ resides only in sinners.[95] For Abailard's confidence in knowledge and the sciences, which since they are the greatest gifts of God cannot be evil or useless in the inquisition of truth, is substituted the spirit of God by the influx of which the individual man alone in the face of God can interpret the text of God. The arts of words have been reduced to their minimum, but new virtues have been evolved; the value of individual insight, the tentative entertainment of any doctrine, the stripping of the structure of theory from the exigencies of practice have crowded out reason, demonstration and system.

V

The picture of the transformation which knowledge and action have undergone as a result of the shifting places of grammar, rhetoric and dialectic is not complete with the statement of the uses to which the dialectician has put grammar and rhetoric and the changes which the grammarian has introduced by submitting dialectic and rhetoric to his art. The rhetorician had long been at work, too, since the times of Isocrates and Quintillian, and by his approach grammar and dialectic are the tools of rhetoric, with resulting profound mutation of both arts and a particular degradation of dialectic. There are Ciceronians in the Renaissance to confound Erasmus, not for his sins against the Holy Spirit but for his sins against the divine Cicero.[96] The ra-

[95] "Brief 11, Luther an Georg Spenlein," *Briefwechsel* I, 35-36.
[96] Cf. Marius Nizolius's letter to Antonius Majoragius in *Marquardi Gudii et Claudii Sarravii senatoris parisiensis epistolae*, Leyden, 1711, pp. 132, 137.

tionale of the rhetorical position is stated emphatically by Nizolius, one of the most ferocious critics of the absurdities of the Middle Ages, whose criticisms, somewhat tempered by notes, Leibniz thought it worthwhile to preserve by a new edition of the *Antibarbarus*. He writes to reproach Majoragius, who had been a good Ciceronian, for his temerity in criticizing the *Paradoxes* of Cicero.

Now listen to what follows: Cicero, you say, is far inferior to Aristotle and the Peripatetics in his method of discourse [*in disserendi ratione*]. But tell me why: is it because no argument of his in the *Paradoxes* is correctly concluded, as you say? But I will reply to you more copiously later in explanation of the *Paradoxes;* now however I say that you do not understand the strength of Cicero's arguments, and you think that they have no value because they are not concluded in the manner of the dialecticians, that is barbarously and ignorantly. You do not understand what a proposition of a single one of the *Paradoxes* is or of what sort it is; you do not know reasons; you do not see to what they are referred; and finally you do not seem to me to perceive sufficiently well the conclusions themselves, but I will treat of this later, as I have said; now I wish to learn from you what dialecticians and philosophers have, by which they discourse better or could discourse better than orators. Is it argumentations? But orators teach and use ten kinds of argumentation, all of which Georgius Trapezuntius treats most fully in the third book of his *Rhetoric*. The dialecticians, however, knew only four, that is, syllogism, induction, enthymeme and example, of which they retain the first two for themselves, but leave the remaining last two for the orators, although the orators notwithstanding do not recognize them as argumentations, but as arguments.[97]

The rhetorician is inferior to the dialectician neither in argumentations nor in the use of argumentations: the pre-

[97] *Ibid.*, pp. 134-35.

cepts of rhetoric are much the clearer and more intelligible; those of dialectic are harder, more thorny, obscurer, to such an extent that those who treat of them often do not seem to understand them. In the propounding of questions, in their dividing, in the thinking out of reasons and in the adding of confirmations to reasons, and finally in inferring with enthememes, which logicians call imperfect syllogisms, but rhetoricians call expositions, in all these questions the rhetoricians have extremely fine and useful precepts, whereas the dialectician has none or extremely few and those stony and useless. For all these reasons Nizolius is convinced that the system of discourse of the rhetorician far from being inferior to that of the dialectician and philosopher is far superior. As a final blow to his adversary, Nizolius lists his errors in grammar, and since that science has changed in the hands of the rhetoricians from the science of the exposition of texts, which it had been for the medieval dialectician, to the treatment of rules of the parts of speech, the errors consist in the use of words that cannot be found in Cicero, of prepositions used instead of conjunctions, or finally, in the use of the word "metaphysics" which should be four Greek words, not one Latin word.[98]

VI

The history of the sciences of words, since it must be written in words, exemplifies its theme while it states it: the historian when he writes the debate of the grammarian, the rhetorician and the dialectician must himself be partisan of one of the disciplines whose protagonists he expounds. That linguistic character of the historian's task extends,

[98] *Ibid.* The innovations of Peter Ramus in grammar, rhetoric and dialectic contribute to the systematization of a similar conception of grammar.

moreover, beyond the limits of histories of the trivium or of philosophy. The historian of military campaigns, of geographical explorations, or courtly intrigues must similarly be the grammarian, the rhetorician or the dialectician as he considers his materials and constructs his narrative. The history of the transition from the Middle Ages to modern times has been written frequently by grammarians, how frequently may be judged from the importance of the place usually given to Erasmus and Luther in the determination of modern ideas. It has been written by rhetoricians, but in recent years such histories have been composed with less gusto than the contemporary of Nizolius would have mustered: they have been literary histories and their great figures have been advanced to a distinction which has not been made to depend on the search for truth or on anything which might make letters seem a rival of science or of religion. The present restatement of that transition has been kept on a grammatical level; it is a collection of texts relevant to some few problems from writers of different periods chosen in the manner of the grammarian, as Abailard set down the contradictory propositions of his *Sic et non*. It was no accident that the history of the dispute of the grammarian, the rhetorician and the dialectician was chosen as the subject of this grammatical exercise, since it is not difficult with the aid of the materials so collected to show how any historical work involves an attitude toward and a solution of that dispute. By design, therefore, little more than a paraphrase of contradictory propositions has been given; there has been very little rhetorical expansion and no dialectical resolution. For the purpose of this essay, like the purpose Abailard confessed to in the "Prologue" to the *Sic et non*, is to raise rather than resolve a problem, to initiate an inquiry by suggesting a doubt, since the key to wis-

dom is, according to Abailard, frequent and assiduous interrogation.[99]

By the nature of discourse the completion of the grammatical task is not the end of the problem. Nor, again, is the path through further problems cleared, once an assemblage of texts, such as that set down in this essay, has been made. It has been pointed out that grammar differs as it is used by the grammarian, the rhetorician and the dialectician. The grammatical collection of data relative to the progress of philosophy from Abailard to the Renaissance assembled here has been limited to questions of theology and the shifting interpretations of the Bible. The same task could have been performed for the more secular part of philosophy and science. The present task differs from that task, however, in that the text which the theologian interpreted, at least during the period under consideration, remained the same, and the differences between the grammarian and the dialectician were differences in the interpretation of a single text on different models and according to different rules. In the history of metaphysics the text changed as well as the mode of interpretation: part of the history can be written in terms of Aristotle treated dialectically, rhetorically and grammatically, but at no time was Aristotle's text of unquestioned authority and for a time it was to fall into complete disrepute. It is easier consequently for a change of interpretation and theory to seem to be the discovery of new facts and the invocation of new experience in the history of metaphysics and physics than it is in the history of theology. But besides the grammar which deals in interpretations which go back ultimately to a single authoritative text, and the grammar of interpretations of different texts none of which is primary and authoritative, there is a third gram-

[99] *Sic et non*, "Prologus," PL 178, 1349.

mar (practiced more frequently than the other two by historians of philosophy in their collections of quotations from philosophers) which is concerned with propositions purporting to be interpretations of no text whatever, but rather to be true propositions concerning nature or the cosmos or the state of things. For the understanding of the grammatical intentions of the present essay, it is important to bear in mind that it is limited to grammar in the first sense. None the less it is equally important to realize while that restriction is being emphasized, that it is grammar of the third sort which is of chief interest to the scientist, the philosopher or indeed the theologian. For the present it is sufficient to suggest that that latter grammar is grammar as it is used by the dialectician, related to the grammar of interpretations as Abailard's use of the texts of the Fathers in his theological works was shown to be related to the grammar of texts which he prepared in his *Sic et non*. But the manner in which discoveries of nature, God and man depend on grammar, rhetoric and dialectic has been shown sufficiently to make obvious the necessity of distinctions at each step. It is the intention of the author to continue this grammatical inquiry and to prepare at some later date similar collections of texts from the history of science to illustrate the latter two manners of grammar: when the distinctions which have been employed in this essay have been fortified by those further materials, it will be time to consider dialectical resolutions, the problems of philosophy and their evolution and finally the character of philosophic truth. What has been set forth is on one level the resolution of the problems invoked: but it is a resolution in the sense that Abailard, Erasmus, Luther, Nizolius each resolved their problems, and that after each resolution there was always another to come. That very succession of resolutions is the

statement of the problem of ultimate interest to the philosopher.

The difficulty of the historian writing the debate of grammarian, rhetorician and dialectician proceeds from the nature of that debate: it is a debate in which the principals did not meet the arguments of their opponents, but instead argued on different levels, and each, therefore, found the position of his opponents trifling and useless and his opponents themselves ignorant and stupid. To determine the case argued by Abailard, Erasmus and Luther, it is useless to appeal to the supposition that the latest step approached more nearly to the truth, that the judgments of later ages, whether the age of Erasmus or the age of the present historian, should therefore silence Abailard, or again to the supposition that the truth can be discovered by going back to the Bible or Augustine or Jerome to whom they all appealed. Yet history cannot be written without some determination of that case, for when the historian comes to set down the careers of Abailard, Erasmus and Luther, he can find at least as many of them as they found Bibles and Augustines and Jeromes. In the long line of Abailards that parade through the history of histories in the guise of historical controversies, the successive persons that have been Abailard take their complexions from the grammarians, the rhetoricians and the occasional dialecticians who have written about them, and the controversies are persistent since no fact can dislodge the historian from any of the three positions, if he understands it properly.

None the less, though each interpretation is impregnable within its own limits, when brought into controversy the debate is ultimately dialectical. Yet the paradox is that the dialectician is little esteemed as historian. We are familiar today with the arguments against excessive musterings of

arguments both in the arranging of the facts of history and in the practice of the philosophical arts. In general it is, as illustrated in the examples of Erasmus and Luther, the grammarian who turns against the dialectician the discovery of man and nature, who asks for scientific authorities and, in turn, makes reason look like authority; it is the rhetorician, as illustrated by the case of Nizolius, who reiterates the grammarian's discovery of the sterility of logic, and substitutes for it an examination of thinking as men think, by which one may hope to arrive at a richer suggestiveness in thought, a greater utility in action and a closer approximation to the nature of things as they are. The grammarian, however, must be content, if he is consistent with himself, to be suspicious of all knowledge; the rhetorician must be content to make utility his test; but when the question is of knowledge, even knowledge of utility, if theory is permitted to enter, dialectic has slipped into place at the top of the three arts. The whole history of the evolution of thought may be stated formally in these terms. Any position, any theory can be taken in grammatical terms, the task being only to understand it; if one is to adhere to it, that must be done unquestioningly; if another does not follow the doctrine, for him that is the end of it until such time as he may happen to undergo a change of heart; so far as dialectic is involved in this view, it is a dialectic of the various possible meanings of the theory. But the development of that theory, when it comes, must be the result of another technique: the rhetorician can show the consequences and can even undertake to spread the theory and persuade others to accept it. When, however, two theories are set one against the other, when the question of the truth of one of them is raised, the technique of the dialectician is needed. So long as there is no two-voiced controversy, the question may remain

on the grammatical or on the rhetorical level. But the equilibrium of the arts under the dominance of dialectic is unstable: the great philosopher produces as followers grammarians more frequently than philosophers, and the discovery of a philosophic truth may be lost even in the repetition of it. Philosophy may be lost to an age by too careful adherence to the conclusions of philosophers, while on the other hand, philosophy may be born to an age by the careful examination of simple statements which were made with no philosophical intention.

The design which motivated the above collection of statements was in this sense philosophical rather than historical. Its accomplishment turned upon the trick of restating a historical sequence of views in terms simply of the ideas they expressed and in thus translating history into a philsophic debate. An understanding of this entry of philosophy into history is important to the understanding of the nature of history. For viewed otherwise than as a philosopher might view them, such debates between historians might seem only illustration of the truism that events may be narrated and interpreted variously, or that it is the nature of history to follow such fashions of narration as affect all literature. Once that philosophic view has been established, however, it may not be impossible to show that there are canons of criticism for history according to which one manner of interpretation is preferable to another. But preliminary to the statement of such canons and to the criticism of the methods of recent historians, it is necessary to have shown the nature of history in explanation of those modern methods. It was hoped that the nature of history might be shown in a collection of statements that have been made; but more important, it was hoped that in segregating the philosophic problems involved in history, the character of philosophic

problems themselves might be shown more clearly, for the examination of what is involved in the making of statements leads not only to the problems of history and to the problems of philosophy that are concealed in history, but to the question of what constitutes the advances in philosophy, the rediscoveries of reason, of God and of nature, so frequently made and so frequently reported in histories. Finally, the essay as a whole, itself an example of the theme it expounds, a grammatical exercise to which the arguments of each of the protagonists with which it deals might be applied, is itself illustration once more of Abailard's favorite quotation from Cicero, that all controversies are concerned with writings or reasons, but ultimately the controversies concerning writings are controversies about reasons.

CARTESIAN DOCTRINE AND THE ANIMAL SOUL: AN INCIDENT IN THE FORMATION OF THE MODERN PHILOSOPHICAL TRADITION

ALBERT G. A. BALZ

CARTESIAN DOCTRINE AND THE ANIMAL SOUL: AN INCIDENT IN THE FORMATION OF THE MODERN PHILOSOPHICAL TRADITION[1]

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I

The Significance of the Problem

THE Cartesian philosophy made the distinction between man and the animals a philosophical problem. By this statement is meant no more than that the question was one with

[1] The primary sources used for this study are the following:

(1) *Essai philosophique sur l'âme des bêtes, où l'on traite de son existence & de sa nature et où l'on méle par occasion Diverses Réflexions sur la nature de la Liberté, sur celle de nos Sensations, sur l'union de l'âme & du Corps, sur l'immortalité de l'âme, &c. Et où l'on réfute diverses objections de Mr. Bayle.* A Amsterdam, Chez François Chanouion, MDCCXXVIII. The author's name is not given, but this seems without doubt to be the work attributed to a certain Boullier. The historian of Cartesianism, Francisque Bouillier (*Hist. de la phil. cartésienne,* 3d ed., Paris, 1868, p. 162, n. 1) refers to *Essai philosophique sur l'âme des bêtes,* by Boullier, 2d ed., Amst. 1737, 2 vols. in 12. In this paper I shall assume that the work before me is that referred to in this *History of Cartesianism.* The book contains an "Avertissement," a "Discours préliminaire," and two parts. The first bears the general title: "Où l'on preuve qu'il doit y avoir dans les Bêtes un principe immateriel." The second part bears the title: "Où l'on recherche quelle est la nature de l'Ame des Bêtes." The author evidently knew many of the writings of the period on the subject. He mentions Dilly, Cudworth, Bayle, Henry More, Locke, Cordemoy, Pardies, Daniel, Régis, La Forge, Fontenelle, Willis, Digby, Shaftesbury, and Leibnitz.

(2) Dilly (Dillyiel) *Traité de l'ame et de la connoissance des bêtes,* etc., Amst., MDCLXXXXI. Bouillier (cited above) refers to a book of the same title by Dilly as printed at Lyon, 1678.

(3) Sigismond Gerdil, *Réceuil de dissertations sur quelques principes de philosophie et de religion,* Paris, MDCCLX. The third dis-

which philosophers were concerned and with which they felt it necessary to deal. Moreover, agreement with the doc-

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sertation bears the title: "Essai sur les caractères distinctifs de l'homme & des animaux brutes, où l'on prouve la spiritualité de l'âme humaine par la nature de son intelligence."

(4) The *Dictionnaire* of Bayle. References are to the translation by Bernard, Birch, Lockman and others, London, MDCCXXXIX. The articles on Pereira, Rorarius, and Sennert, especially, have been utilized.

(5) Daniel, *Voyage du monde de Descartes, Nouvelle édition, revue & augmentée d'une cinquième partie, ajoutée aux quatre precedents.* Par le P. G. Daniel, de la Compagnie de Jesus. A Paris, chez Nicolas Pepie. MDCCII. Also, Daniel, *Nouvelle difficultez proposées à l'auteur du Voyage du monde de Descartes;* Paris, MDCCLXXXX (The Privilège du Roy is dated 1693).

(6) *Amusement philosophique sur le Language des Bestes,* attributed to one Bougeant; Paris, MDCCXXXIX.

(7) De la Chambre, *Traité de la connoissance des animaux, où tout ce qui a esté dit Pour, & Contre le raisonnement des bestes, est examiné.* Paris, MDCLXIV. I have discussed La Chambre's mixture of Cartesian and scholastic ideas in a paper in the *Phil. Review.*

(8) *Histoire Critique de l'âme des bêtes, contenant Les Sentimens des Philosophes Anciens, & ceux des Modernes sur cette matiére,* Par M. Guer, avocat. A Amsterdam, Chez F. Changuion, MDCCXLIX, 2 vols. in one.

(9) J. B. DuHamel, *De corpore animato, Libri quatuor, seu promotae per experimenta philosophiae, specimen alterum.* Paris, MDCLXXIII. Also Ioan. Bapt. Du Hamel, *De consensu veteris et novae philosophiae, Libri duo,* Paris, 1663.

Other relevant documents of the period will be referred to as needed. For an interesting compilation of the old and the new meanings of terms, the following is of great value: Chauvin, *Lexicon, rationale sive thesaurus philosophicus ordine alphabetico digestus, in quo vocabula omnia philosophica, variasque illorum acceptiones, juxta cum veterum, tum recentiorum placita, explicare; & universe quae lumine naturali sciri possunt, non tam concludere quam recludere conatur.* Rotterdam, MDCXCII.

In the footnotes the works above listed will be referred to by the author's name, with initials to indicate the volume in cases where more than one work of the same author is used.

I have not attempted to bring the quotations into conformity with modern usage by modernizing the spelling or by altering and supplying accents. It should be added that, in order to avoid burdening the text with corroborative materials, I have preferred to add to the number and length of the footnotes.

trine of the automatism of animals was taken as a decisive test of philosophical affiliation. The Cartesian arguments for the existence of God can be taken as a criterion for determining whether an alleged champion of the new philosophy really understood Descartes. In a similar way, adherence to automatism formed a test of fidelity. If one were a genuine Cartesian, one proclaimed that animals are machines. But if one asserted his discipleship, but denied that animals are machines, that discipleship was a mockery.[2]

The question as to whether animals are or are not machines led to an extended controversy. The problem had a many-sided meaning for the intellectual situation of the age. Whatever its merits in itself, for the historian of ideas it is a privileged illustration of the conflicts within seventeenth and eighteen-century thought. The Cartesian dualism, with a knife-like stroke, had divided existence into two portions. If one thought with Descartes, either animals be-

[2] Daniel, p. 430. Dilly also forms an excellent witness to this. Descartes alone, he states, has taught us to know the nature of the soul and has defined the "caractere veritable" that distinguishes us from the beasts. Moreover, "La connoissance de cette question [*i.e.*, of brutes] est absolument necessaire pour la parfaite intelligence de la Philosophie: car soit qu'on se range du costé des Philosophes qu'on appelle nouveaux, ou qu'avec le grand nombre & la foule ou se tienne attache à la philosophie des Anciens & principalement à celle d'Aristote, on est obligé de s'en instruire à fond" ("Preface"). The question is especially important for the new philosophers because of "la liaison estroite, que ce point particulier a avec les principaux fondemens de leur Metaphysique & de leur Physique" (*Ibid.*). Daniel (*Nouv. Diff.*, pp. 4-5) makes the objector state that the very "pierre de touche" of Cartesianism, the very test of the fidelity of the disciple, is furnished by adherence to "la doctrine des Automates."

It is worth noting in addition that Descartes was not acquainted with the *Antoniana-Margarita* of Gomez Pereira, a work published in 1554 in which animals were taken to be machines. Descartes in a letter to Mersenne states that he has not seen this work and does not think he needs to see it (Letter CCXLIV, Adam and Tannery ed.). Bayle doubts if Descartes had heard of the work, which Bayle says is scarce (*Dict.*, article, "Pereira").

longed to both spheres of existence, or they belonged to one of these two. Or, if the thinker defined existence as a single sphere, both animals and men fell within it, but he could not accept Cartesian metaphysical principles. If to some inquirers the conception of animals as merely automata was an important discovery, to many it was a stone of stumbling. In either case the doctrine did not have a "scientific" interest primarily. The position was welcomed less because it supplied a metaphysical foundation for the scientific study of the animate order than because it furnished a new support for ancient convictions. Religion and theology—in their traditional forms—might be weakened on one side by the newer ways of thinking, but on another side might find compensatory strength through the doctrine of the animal machine. On the other hand, to maintain unimpaired the older metaphysical supports for religious and theological tradition implied a denial not merely of the new attacks upon this tradition but also a rejection of the alleged new reinforcements. In short, to admit the value of new demonstrations of the existence of God or of novel assurances of human immortality was to many minds suspiciously like acknowledging that the older foundations of belief were inadequate. In reply to a comment of Mersenne to the effect that in the *Meditations* he has said not a word concerning the immortality of the soul, Descartes replied that Mersenne should not be astonished, "car ie ne sçaurois pas demonstrer que Dieu ne la puisse annihiler, mais seulement qu'elle est d'une nature entierement distincte de celle du cors, & par consequent qu'elle n'est point naturellment sujette à mourir avec luy, qui est tout ce qui est requis pour establir la Religion."[3] But many Cartesians found a much more positive support for religion in the doctrine, and especially when

[3] Letter CCXXIII, Adam and Tannery ed. III, 266.

the distinction of substances was reinforced by the automatism of animals. On the other hand, the conception of animals as machines was a difficulty to many, both Cartesians and anti-Cartesians, precisely because it could not be reconciled with certain historical ideas, and constituted a veiled threat against theology.

The Cartesian position that animals are automata was a by-product of the dualism of finite substances. The grounds that determined the dualism of the human body and soul, however, did not in themselves dictate the doctrine of the automatism of animals. What it implied was this, that in so far as animals possess powers resembling powers in man, what was done with these powers in man must receive a similar treatment in the animals. If in man such faculties are resident in the soul substance, then, if they are possessed by animals, there must exist an animal soul. If animals think, and if thinking in man implies a soul, then the animals too are endowed with a soul. As a consequence of this, the situation bristled with dangers. Many Cartesians discovered in the dualism a new method of assuring such desiderata as the immortality of the soul, and also a new means for asserting man's essential superiority to the order of nature. It was all the more imperative that man should escape inclusion in nature when nature had come to be defined as a vast network of relations in space. But with this gain went commensurate dangers. In the traditional scale of creation from matter to God, man's position above the animals and lower than the angels was quite secure. The Cartesian dualism in one sense destroyed the hierarchy, but safely placed man above nature. However, when the animal is envisaged in terms of the dualism there is danger that too much will be proved. Man might lose his uniqueness in creation. In so far as it could be shown that man pos-

sesses powers and activities not granted the animals, then at least this much was fixed, namely, that the animal soul, if there were one, must be of an order different from and inferior to the human. On the other hand, the more successfully physiology and neurology could be worked out on the dualistic, *i.e.*, on the mechanistic basis, the more facts that could reasonably be explained as due to the machine, the less the need for an animal soul. But success in dispensing with an animal soul brought precisely the danger that the argument would be extended to man, to the undermining of his privileged position. If the animal can satisfactorily be described as a machine, then the more varied and the greater the powers of the animal, the greater the probability of the inference that man too is an automaton.

These considerations will be illustrated in detail later on. Enough has been said to indicate that the problem was inescapable. There are two general observations, however, that should be made by way of introduction. In the first place attention should be called to the stereotyped and patterned character of treatments of the problem. The arguments for automatism are constantly repeated: they follow a fixed pattern, with variations of detail. But this is equally true of the arguments against automatism. In the same way there is a stereotyped character about the attacks of the automatists upon the defenders of animal souls—the defenders being in the main Scholastics. And finally, even with those who wish to compromise, and to maintain an animal soul while adopting the Cartesian definition of spiritual substance, are forced again and again to the same pattern of thought. This constant reiteration, with variation only in detail, and no genuine advance in thought, deserves comment. It indicates that the intellectual situation was marked by the conflict of incompatible metaphysical ideas, and not by interests

in specific scientific inquiries. A vast number of books were devoted to the controversy. If occasionally the problem was treated with levity and as an opportunity for wits, nevertheless it was in most cases treated with extraordinary seriousness. Yet it remained a metaphysical problem. Guer, who amuses himself at the expense of all parties—the automatists, the advocates of spiritual souls for animals, and the advocates of substantial forms—finally says, in effect, that there is not much to choose among them so far as a real advance in knowledge is concerned. Between the substantial forms, which the Cartesians say are mere words, and the Cartesian's constant reference to "a certain motion of the animal spirits," Guer thinks there is really little to choose. And it is evident that this author suspects that, religion aside, there is little merit to the controversy.[4]

This leads directly to the second observation. There were many common factors in the attitudes of the Cartesian automatists and the anti-Cartesians. For both of these groups the vital interest of the problem lies primarily in its real or imagined connections with traditional religious, theological and ethical ideas. The problem for the Cartesian was the adjustment of animal automatism to the task of supporting tradition by means of the Cartesian metaphysics as a whole. Bayle notes the many theological advantages of this automatist position. He indicates that, since automatism deprives the brutes of even sensibility, it follows that the brutes do not suffer. In this way the Cartesian may avoid contradicting the principle that only sinful creatures suffer. Moreover, automatism, which deprives the animal of suffering, leaves unimpaired the proof of original sin by an argument from the suffering of infants.[5] Bouillier, more-

[4] Guer, pp. 276 ff.
[5] *Dict.*, article "Rorarius," n. C; Vol. VIII.

over, thinks that Descartes, who was the first to bring to light "la grande verite de la distinction de l'ame et du corps," was led to the automatist position by religious reasons. He would never have subscribed to it, Bouillier thinks, had he not felt that the notion of the soul of brutes was dangerous to the interests of religion. For the anti-automatists, on the other hand, the refutation of the doctrine of automatism provided an opportunity for casting discredit upon Cartesianism as a whole.[6] Moreover, there was more than one effort to overcome the difficulties of automatism by employing Cartesian ideas to justify a new application of scholastic principles. Finally, skepticism found in the doctrine an opportunity to display the essential insolubility of the problem by giving a vast array of pros and cons. Boullier observes that while many books on the question treat it as a philosophical problem, there frequently occurs an effort to manipulate the controversy for the purposes of skepticism, and therefore to make it an indirect attack upon religion and morality.[7] He notes the diabolical cleverness of the maneuver: the hypothesis of automatism is made ridiculous by the skeptic and so rejected; then, insisting upon the essential similarity of animals and man, the skeptic concludes that the difference between animals and men is one of degree only. This similarity is made all the more striking because the hypothesis of automatism is applied by Cartesians to the human body as strictly as to the animals. In any case without bodies not even Cartesians will admit passions and pleasure and pain for men. Given the similarity between animals and men, with the body as the source of the passions, the skeptic reaches a naturalistic and hedonistic system of ethics. Thus even the skeptic turned

[6] B, Part II, p. 184.
[7] B. "Avertissement." It is evident that the writer has Bayle in mind.

to the doctrine of automatism with an intellectual ax to grind. It is no wonder that Boullier and others thought the dangers real and compromise necessary.

It must be recognized that the problem of the animal soul was bound up with the much-discussed question as to whether animals reason, or possess intelligence. In the intellectual conditions that prevailed, however, this matter could scarcely be investigated or the problem formulated, without taking a stand with respect to the metaphysical problem of the soul. With the Cartesians, the issue is clear. With their opponents, the issue is not so clear; by distinctions in the sources of knowledge and in kinds of ideas, they seek to retain for the animals some measure of knowledge and intelligence, and to find a way of escaping a choice between automatism on the one hand and endowing the brute with a soul too similar to the human on the other hand.

II

The Exposition of the Cartesian's Position

Boullier adopts the artifice of representing a Cartesian as setting forth the doctrine of automatism. The doctrine that Boullier thus puts into the mouth of "the Cartesian" is of course his own version rather than an exact account of some contemporary treatment of the subject. It departs from the teaching of Descartes himself. Moreover, Boullier's statement of automatism is shaped beforehand so as to facilitate refutation. Thus our author provides us with a pattern that reflects not only the theory of animals as machines but also the attitude and motives of those who found the doctrine unacceptable. In setting forth Boullier's pattern, we shall have opportunity to observe certain interesting variants.

The Cartesian, as Boullier represents him, begins with the statement of his presuppositions.

Je présupose connue la distinction réelle, et la difference essentielle des deux substances, avec celle des proprietez et des opérations qui sont propres à chacun. *Descartes* l'a montré, S. *Augustin* l'avoit prouvé longtems avant lui, et, à la honte du Genre-humain, il ne falloit qu'un peu de bonsens pour s'en convaincre; tout sentiment est une perception et une pensée; il ne peut se trouver que dans un sujet qui se connoît soi-même, c'est-à-dire dans un esprit, et par consequent le sentiment ne peut se trouver dans la matiére. Il y a une contradiction, il y a impossibilité métaphysique, que la matière sente, et soit capable de sentiment, comme il y a contradiction qu'elle pense. . . . On ne sauroit contester non plus, que le Corps humain ne soit une machine.[8] . . .

These are the presuppositions of the Cartesian—but it is important to note that they are the presuppositions of Boullier also. It is not merely the exposition of the Cartesian position of automatism, but also its refutation, that assumes the dualism of substances. Boullier is not the sole instance of this. We must, in short, recognize several types of refutation. There is the type which is based upon an acceptance of the dualism of substances, but despite this common ground seeks to disprove the thesis that animals are only machines. Ad-

[8] B, Part I, Chap. I, p. 11. On the next page a machine is defined as "un tout formé de l'assemblage regulier de diverses parties tellement disposées, enchainées, & proportionées l'une à l'autre, qu'il en résulte un mouvement uniforme & regulier, par rapport à ce tout." ". . . A Beast is a meer Automaton or Engin: that is, an Animal destitute of all Knowledge, and consequently may be thus defined: A Beast is an Artificial Engin or Machin of GOD, furnished with a various and wonderful structure of Organs, containing in itself a material principle of Life, Motion and Sense" (*An Entire Body of Philosophy, according to the Principles of the Famous Renate des Cartes, . . . Written Originally in Latin by the Learned Anthony Le Grand, Now Carefully Translated from the Last Corrections, Alterations, and Large Additions of the Author, Never Yet Published.* . . . London, MDCXCIV. Part VII, Chap. XVIII, p. 254.)

mitting that matter cannot feel or think, it is urged that beasts must have souls that in some degree are quite similar to human souls and wholly distinct from matter. It is worth noting that Père Roche devotes a chapter to an attack upon those who attribute to beasts souls that are immaterial, and so far spiritual, although urging that these animal souls are destructible despite their immateriality.[9] Again Louis de la Forge urges that, if it were demonstrated that animals possess cognition, it would necessarily follow that they possess spiritual souls. But he refuses to admit that this conclusion would imply the essential substantial identity of the brute and the human soul; for, he says, it is not necessary to believe that "tout ce qui est Spirituel soit de mesme espece."[10] In various other ways the dualism of substances is accepted —the identification of spirituality, thought, and feeling granted—and nevertheless the doctrine that animals are merely machines is rejected and some opponent theory advanced. Again, there are refutations of automatism which do not rest upon any essential agreement with Cartesian metaphysics. The proponent of Scholasticism argues against the machine theory, but on the basis of a radically different system of thought. Refutations of this type, then, imply a virtual rejection of Cartesianism as a whole, so that the argument against automatism becomes in principle an attack upon the Cartesian system. And finally, we should

[9] *Traité de la Nature de l'Ame et de l'Origine de ses Connoissances, Contre le Systeme de M. Locke & de ses Partisans.* 2 vols. Amst., MDCCLIX, Chap. X.

[10] *Traité de l'esprit de l'homme, de ses facultez et fonctions et de son union avec le corps. Suivant les Principes de Rene Descartes.* Paris, Girard, MDCLXVI, p. 31. Guer asserts that four points of view have dominated the modern controversy: first, the view of those who insist that beasts have spiritual souls; second, those who admit only instinct; third, those who assert the existence of a "substance mitoyenne" between matter and spirit, called substantial forms; and finally, the view that defines beasts as pure machines. Vol. II, p. 15.

perhaps note those eclecticisms which present a confused mixture of Cartesian and scholastic principles serving as a basis of compromise between the opposed views.

There is one other observation to be made concerning the attitude of Boullier since it is typical of many of the refutations based upon agreement with the doctrine of two substances. Boullier accepts the doctrine that the human body is a machine. In fact, Boullier and many others, whatever they propose about the brute soul, sense the difficulties inherent in the pineal-gland theory and the notion of the soul as capable of redirecting the flow of the animal spirits. These ideas were indeed largely given up. Huet records the fact that Cartesians had formerly greatly admired the pineal-gland theory: it is significant, however, that Huet thinks that this admiration is a thing of the past, no longer regarded as an essential element in Cartesian philosophy.[11] The result of this indifference to the pineal-gland theory is a clarification of the issue. The objective of a refutation based on dualism is not primarily to disprove the thesis that the animal body is a machine, for even the human body is that, but rather to prove the existence of a soul adjoined to the animal body. As with man, so with the animals: the machine alone is insufficient to account for the facts of behavior. The definition of the organized body as a machine may raise the difficult question of the efficiency of the soul. But this question is not rendered more difficult by the existence of an animal soul, for it arises in its most acute form in connection with man conceived as a dual being.

To return now to Boullier's Cartesian. He begins with neurology and a statement of the "marvelous union" of body and soul. The "union" is described as a "certain re-

[11] *Censura philosophiae cartesianae,* Lutetiæ Parisiorum, MDCLXXXIX, p. 97.

ciprocal dependence between the two substances,'' or it is said to consist in a ''mutual correspondence of thoughts and movements'' with the result that the soul is at every moment acting on the body and producing movements while in similar fashion the body acts upon the soul.[12] In some manner the soul may contribute to the movements of the body and the bodily processes may contribute to the events in the soul. But this is not to be taken as equivalent to a denial that the body is a machine. Boullier's Cartesian proceeds to distinguish between those processes which proceed from the pure mechanism of the body and those that depend upon the union of body and soul. Thus there are ''absolute involuntary'' movements, independent of the soul. The ''principle'' of the life of the body is not within the spiritual substance. The Cartesian is impressed with the appropriateness, the utility, of the involuntary response to a stimulus. This utility of response, of course, might well occur if the process, arising in the sense organs, led to and through the soul, and thence back to the body and its muscles. But, thinks the Cartesian, it is simpler to explain the facts by means of the bodily mechanism only. The correlation of stimulus and reaction is due to the structure of the machine.

This implies a fundamental merit of the machine hypothesis, that is, its economy. But this economy refers not so much to scientific methodology as to theology. The Cartesian is driven to a denial of souls to animals. Animals are automata. This conclusion is demanded by metaphysics. As an incidental by-product it provides economy in explanation,

[12] Part I, pp. 15 ff. Boullier represents the Cartesian as stating that God has given the soul a confused, but strong and constant, sensation or perception of the sensorium (the pineal gland?), with the result that the soul perceives the movements of the pineal gland in the form of sensations, and in virtue of the correlation of sensorium and body, is thus able to perceive the movements of the latter.

and brings neurology and physiology within the realm of natural science. But, as we shall see later, a chief objection to the animal soul (that is, to a spiritual substance adjoined to the animal body) is theological and religious. At the same time, however, refutations of automatism may rest upon the same basis. This defines an intellectual crisis. The hypothesis of automatism must be subordinated to teleology.

The Cartesian thus urges that the sufficiency of the automaton indicates the perfect workmanship of the Creator.[13] To prove automatism, the Cartesian is made to appeal to the facts of habit, reflex action, natural antipathies, and the passions. We must recognize that Boullier does not make his account of the Cartesian position internally self-consistent. This may be due to his desire to make his refutation easier. It is equally probable, however, that the inconsistencies attributed to the Cartesian by Boullier fairly represent the confusions characteristic of many Cartesian writers of the day. Thus Boullier represents the Cartesian as stating that the power of the bodily mechanism is "extrêmement" limited by the laws of the union of soul and body. These laws permit the mechanism to operate without interference only so long as its operations accord with the purpose of this union. The limitations upon mechanism are expressive of divine purpose. Now the purpose of the bodily mechanism is *not* the conservation of the body, either directly or indirectly. Rather, since the soul is the nobler thing, the body is its instrument—it is a means of obtaining "certaines connoissances," "certaines sensations"; and, finally, the body provides the soul with the matter and with the occasion for the exercise of a great number of virtues.[14] Since the soul must preside over the conservation of the body, per-

[13] Part I, Chap. 2, p. 23.
[14] *Ibid.*, pp. 26-27.

ception is interposed between impression in the brain and bodily movement. Thus the existence of the bodily machine, and its control by the soul in whatever sense and measure that control obtains, are intelligible in terms of the rôle God has designed for man and in these terms alone.

It is not easy to discern precisely what Boullier attributes to the Cartesian. In his account there may be the after-consequences of the pineal-gland theory. Or of the occasionalistic position: *i.e.*, that in some cases the occasioning cause for the spiritual event lies within the body, while in other instances the occasioning cause is within the soul and is thus logically prior to the bodily correlate. Boullier's Cartesian, at all events, seems to mean that the body-machine may operate on occasion in complete independence of the soul, and perhaps without the soul's awareness of the activity; in other respects, the soul becomes aware of the bodily situation, and somehow directs the machine. An idea, arising within the soul from its own intrinsic energies, occasions the bodily reaction and in so far has a certain control over it. The operation within the body remains mechanical, however, since only the direction of the animal spirits can be altered by the soul substance, if indeed that is possible.

The sufficiency of the bodily machine and the soul's control over the mechanism, in whatever sense this occurs, are equally expressive of the excellency of craftsmanship displayed by the Creator. But laying aside the case of man, and turning to the animal, the teleological character of the arguments is clear. The striking fact about animal behavior is its adaptation to the conditions of action for the fulfillment of bodily needs. This, in the Cartesian's terms, is the harmony between the automaton and the world of things, a harmony the natural end of which is the conservation of the machine. If the things and events of nature can be

explained in terms of mechanical principles, it is all the more probable that a creature without moral significance, that is, the animal, can be understood in terms of similar principles. However, the animal cannot be satisfactorily described *as* a machine unless we can demonstrate that it *is* a machine. The success of our description of the animal as a machine may well suggest the automaton hypothesis. This is insufficient. Mechanism as a methodological procedure needs a sanction. This seems to be what Boullier's Cartesian has in mind. The animal machine, if it be a machine, is this precisely because mechanism is the plan according to which divine purposes are carried out.

You cannot deny, urges the Cartesian, that God *could* make a machine similar to the body of a horse or a dog —a machine capable of self-maintenance. Moreover, God could well establish such a harmony between the automaton and the bodies that environ it that the impressions made by things, combined with the internal conditions of the automaton, would result in movements "convenables aux objets, proportionez au bien de la machine."[15] There is une organization particuliére dans les bêtes, que le Créateur y aura produite, & qu'il aura differemment reglée dans les diverses espéces d'animaux, mais toujours proportionnément aux objets, toûjours par rapport au grand but de la conservation de l'individu & de l'espéce. . . . L'idée d'une telle harmonie paroît grande & digne de Dieu.[16]

The same point of view is expressed by Dilly. We are enjoined to consider the animal with this in mind, that the animal is made so as to exist without recourse to any inner conscious principle of control. Moreover, we must consider the environing bodies with the recognition that they as well as the brute were made by one and the same Author. It

[15] Part I, Chap. 3, pp. 35-6.
[16] *Ibid.*, p. 40.

follows that the animal is designed to pursue the useful and to avoid the injurious. In general, the Creator made animals and things with a view to their interadjustment. A horse will refuse to go forward when it sees a precipice because God has disposed his organs to such an effect that the objects cause the animal spirits to flow to the muscles of arrest.[17]

The end of animal life is nothing more than its own conservation. With man, however, the lower must be subservient to the nobler. Now since man indubitably has a soul—and this is admitted by all parties to the controversy[18]—it fol-

[17] Dilly, Chap. XVII; Chap. XXII, p. 213.

[18] It is important to note that the controversy concerning the animal soul, at least in the stage with which we are now interested, is prior to a universal materialism. None of the sources upon which this study is based indicate that the doctrine that man is wholly a machine is seriously entertained. That is to say, none of the parties to the controversy deny the existence of the human soul, as something distinct from matter, whether or no the Cartesian soul substance be accepted. Some writers recognize the danger implied in proclaiming the sufficiency of mechanism for the animal: that is, they perceive that the argument may be extended to man. Dilly refutes this very argument by pointing out that man is immediately aware of his thinking (pensee), and insists that thought cannot be a derivative of extension (Dilly, Chap. XI). Bougeant points out that I am immediately aware of my own existence as a thinking being, but acknowledges that other men may be, so far as I can know, mere soulless machines (pp. 9-10). Similarly, Guer reports the same argument. The inference to the possession of souls by other men is precisely on a par with the inference to the souls of beasts (pp. 120 ff.). To make a machine having all the activities and appearances of a human being is within the competence of God, as Bougeant points out (pp. 9-10). But none of this implies a real skepticism concerning the existence of the human soul. These arguments are recognized to be just factors in polemic, mainly useful in counteracting the theological arguments against the animal soul. The skeptic may use similar arguments, but not so much in order to entertain the possibility that man is soul-less as to advance the skeptical position in general and to throw discredit upon pretensions to knowledge. Certainly the function of Bayle's criticisms is not to demonstrate that man is an automaton. Gerdil, it is significant to add, writing at a later time and in reaction to De la Mettrie, takes of course a very different attitude (cf. Appendix B).

lows that the human bodily machine is neither an end in itself nor can it define the end of man as the composite of soul and body. From this it follows that, where something more and other than bodily conservation is the end, mechanism is necessarily limited. It is somehow limited by the laws of the union of body and soul. In some sense, then, the control of the mechanism by the spiritual substance is demanded by the very nature of the end of man. In the case of the animals, the end of life is continuation of life, and nothing more: translated into other terms, this means that mechanism and self-maintenance imply each other. In so far as with man the maintenance of bodily life can justly be defined as a purpose of his existence, to this extent we shall expect to find man a machine. And where the whole end of a living thing is merely maintenance and conservation, there we can expect to find nothing save a machine. Mechanism is a principle of economy, even for God. For the maintenance of life a machine is quite appropriate. Anything more would be waste. The Creator's wisdom would be questioned were animals more than machines. In the circumstances—and this is evidently the background of the Cartesian's argument—the hypothesis of automatism is the simpler, in this special sense of the word.

The argument of the Cartesian continues in the same strain. Man is capable of making machines of surprising capacity: all the more may we expect inventive mechanical capacity on the part of God. The phenomena of animal instinct afford an especially clear demonstration of the animal's automatism. For animal instinct does indeed imply reason—but an "exterior reason," a creative reason that produces rational effects by mechanical means.[19] It is the

[19] Bayle tells us that this doctrine of an "exterior reason" was advanced in *Essais Nouveaux de morale,* Paris, 1686, but does not give

misinterpretation of this that has produced the notion of a world soul. The Cartesian, in short, substitutes for the world soul the universal mechanical process that is the manifestation of the perfect divine creativeness. The spirit of the argument is throughout teleological. The instance of man's exceptionableness provides no difficulty. For, whether the creature be animal or man, whether or not there be adjoined to the mechanical system a soul, in every case we are confronted with the extraordinary complexity of the machine. That is to say, from the Cartesian's standpoint, since the soul merely redirects the courses of the animal spirits, but is not their source, the complexity and variety of stimulations and reactions imply proportionate intricacy in the nervous system of man. The presence of a soul in man does not imply less complexity in his bodily machine. Accordingly, the opponent of automatism cannot draw support from the unimaginable complexity that must characterize the animal body if animal behavior is due solely to the body. Since bodily events are one thing and mental events another, the addition of an animal soul does not simplify the operations of the animal body.[20] Back of this argumentation lies, of course, a general presupposition, namely, that where "natural" ends alone are involved, the Creator is content with mechanism. But where the ends are moral, *i.e.*, essentially supernatural, mechanism is insufficient. We may say either that the existence of the human soul proves that man is more than nature; or we may say that because God has designed for man more than the life of bodily conservation with respect to both individual and species, he has en-

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the name of the author. The doctrine seems to be an illustration of the fact that, in the controversy before us, design and mechanism are virtually co-implicative.

[20] Part I, Chap. IV, pp. 46 ff.

dowed man with a soul. And this, indeed, is the real meaning of "the empire" that the soul has over the body.

III

The "Réfutation du Systême des Automates"

The Cartesians, states our author,

disent de belles et bonnes choses quand ils nous parlent de la fécondité des loix du mouvement, des miraculeux effets de la Méchanique, de l'étendue incompréhensible de l'Entendement divin. . . . Je regarde cette idée féconde et presqu'infinie des possibilitez méchaniques, des combinaisons de la figure & du mouvement, jointe à celle de la sagesse & de la puissance du Créateur, comme le forte inexpugnable du Cartésianisme.[21]

But withal, the question is one of fact. Let us agree that God does not deceive. If, however, the facts seem to demand an animal soul in order that we may understand them, then, if animals really are machines, it follows that God does deceive us. Boullier states that this retort to the automatist was made by both Pardies and Daniel. Boullier, however, recognizes that the retort is insufficient. The dangerous argument is as follows: if the Cartesian arguments succeed in demonstrating that animals are automata; if it be proved that all the activities of animals can be explained upon this hypothesis; then, by parity of reasoning, we cannot be assured that any man, with the exception of onesself, possesses a soul.[22] The Cartesian argument is in danger of being too impressive, to the unholy glee of the Pyrrhonians to whom Boullier refers.

The argument occurs in a special form. Thus, according to Dilly, Pardies argues that it is unworthy of God to give

[21] Part I, Chap. V, p. 58.
[22] *Ibid.*, pp. 61-62. Cf. note 18 above.

animals organs such as eyes and ears which must be merely a mere show and must be without function; for, if matter cannot think, and if sensation and perception are special modes of thought, the sense organs of the animals provide no sense impressions and therefore are without any utility whatever. Dilly insists that Pardies misrepresents the situation. The sense organs in the animal machine do possess a real office (although they cannot of course provide even occasions for sensations in the soul where no soul exists), for the sense organs permit things to influence the automaton and so make for its preservation.[23] Dilly is probably quite unfair to Pardies. We must bear in mind that behind this controversy lies an agreement concerning this, that God does things in a reasonable and proportionate manner. If man be unique in the possession of a spiritual substance added to his bodily machine, it is quite extraordinary that this bodily machine should so greatly resemble these other machines called animals which do not possess any souls whatever. One would expect the human body to be so unlike the animal body that the uniqueness of man would be as strongly suggested by the peculiarity of his body as by his possession of a soul. If the human eye be similar to the eye of the dog, why should we not expect visual sensation in the latter as well as in the former? The difficulty is by no means confined to Pardies. Du Hamel in his eclecticism illustrates the point quite clearly. It is difficult to deny sensation and feeling to animals since they are endowed with eyes, ears and other organs adapted to sense perception. It is equally difficult to admit that extended substance can feel or think. If corporeal substance be capable of perception, how can we distinguish soul and body at all? Brutes distinguish one thing from another—shall we deny

[23] Dilly, Chap. XXIII.

them perception and attention? If we do, how shall we explain why the images or forms in the brain do not blur one another? In short, it is not easy to see how we can show the utility of sense organs at all unless we posit a soul with powers of perception and discrimination to take advantage of their functioning.[24] Dilly argues from the "marvellous activities" that man performs without the employment of the soul. Actions, such as reflex adjustments of which we are not aware and which we do not control, prove how far mechanical explanation will extend. If such as these, and the process of prenatal growth, can be explained mechanically, how can we limit the possibilities of mechanical explanation with regard to the brutes?[25] But others, and among them Du Hamel, feel that the marvels of animal behavior —for example the wonders of instinctive behavior—are just what constitute the chief obstacle to the automatist theory.

We may leave these details and return to Boullier. It must be admitted, states Boullier, that if God can make a machine which "par la seule disposition de ses ressorts exécute toutes les actions surprenantes que l'on admire dans un chien . . . il peut former d'autres machines qui imiteront toutes les actions des hommes."[26] In God's mind are comprehended all the possibilities of movements and of their combinations. If between the machines made by men, and the creatures of God, such as animals and men, there is but a difference of degree, *i.e.*, of the complexity of mechanical construction: and if the machine imply a machine-maker whose power and intelligence are commensurate with each other: then most dangerous conclusions will follow. For just as human power and intelligence suffice to explain the pos-

[24] Du Hamel, *De corpore animato*, p. 304.
[25] Dilly, Chap. XVI.
[26] Part I, Chap. VI, p. 63. Cf. Daniel, *Nouv. Dif.*, pp. 70 ff, 100 ff.

sibilities of man-made machines, just so we need not infer from animal and human machines to a being of infinite power and intelligence, but to the presence in the world of intelligences other than "Dieu & son propre Esprit." The fabricator of man may be more than human but less than Omnipotence. God would prove to be a hypothesis out of all reasonable proportion to the facts.[27] Guer states that the Peripatetics have several retorts to make when God's competence as a maker of machines is urged. In the first place, they may reply that if God be capable of making a machine of such complexity as man, He may be equally capable of inventing a midway substance, something between matter and spiritual substance, so that animals may be more than machines and less than man. In any case, the Peripatetic continues, the argument is in effect invalid. For the doctrine that animals are machines depends upon the possession of so much knowledge concerning the details of machines and especially of the alleged animal machines that we may decide whether mechanical explanation is possible. And finally, the Peripatetic retorts that in countering the question: can you prove that God cannot make a machine exactly like an animal? we may ask: how can you prove that God can do so?[28] The argument from God's competence is irrelevant.

The entire situation can be inverted, urges Boullier. If we once admit, what the facts really suggest, that man and the animals differ in degree rather than in kind, we may argue with equal force to the conclusion that animals and men are alike machines, or that souls are present in both cases. If men are machines with souls adjoined, which the Cartesian admits, then we may insist that animals with respect to the possession of souls connected with the body dif-

[27] Part I, Chap. VI, p. 64.
[28] Guer, II, 291-97.

fer from man only in degree. The fact is that animals and men resemble one another too much to make a radical difference between them wholly intelligible. This conviction is present throughout the writers who criticize the doctrine of automatism. And even some Cartesians feel the need of explaining why their position carries so little conviction. The intelligent activities of man are due to a rational soul. But animals act in ways that suggest intelligence. This, for the Cartesian, is an indication of divine skill in design. But why is it so difficult to obtain assent to automatism when God's competence will be granted? The reason is that man insists upon humanizing the animals. We believe ourselves to be the cause of our acts; we think that our souls are the conservators of our bodies; we are convinced of the soul's power to affect and guide the body: and so, not believing that our bodies are independent of the soul, we find the thought of the animal as a machine quite difficult.[29]

By considerations such as the above, Boullier thinks, the issue cannot be settled. Nor can it be settled by the usual arguments from language.[30] It is idle to base argument

[29] Cf. Abbe Lanion (Guillaume Wander), *Méditations sur la métaphysique*, Cologne, 1684; given in Bayle's *Réceuil de quelques pièces curieuses concernant la philosophie de M. Descartes*, Amst, MDCLXXXIV.

[30] Organized discourse in man can be interpreted mechanistically. It may be argued that corresponding to the diversity of verbal signs (as stimuli) there exists an equivalent diversity of responses following mechanically from the stimuli. On the other hand, if language in man necessarily implies a soul, then in some degree animal communication will imply a similar foundation (Boullier, pp. 64-66). De la Forge, as Boullier indicates, deduces "une notable difference entre les Hommes & les autres animaux" from the fact that language is a matter of "institution." De la Forge argues that the natural, involuntary and unlearned bodily expression of the passions are universally the same in all animals of the same species, including man. But since languages differ from one human society to another, and even the deaf have not one but a diversity of sign systems, language in man is clearly due to "institution." But language in this sense, as due to

upon what is possible for God. Concretely the facts imply, in man, the presence of a soul. The real question is therefore whether we can discover in the behavior of animals facts that point to something analogous to what we know to exist in man, that is, a soul. Since, in point of fact, God did not make man a machine, although we may admit God's competence for the task, when we turn to the animals the safer course to pursue is to expect God to have followed an analogous plan. This is better than an appeal to mere abstract possibilities.[31]

An animal soul, in short, is something that one can understand. The limits and possibilities of mechanism are unknown. This attitude of Boullier's then, represents an interesting contrast to a later standpoint. It is not souls but machines, that are speculative conceptions. The concept of the soul is, for Boullier, traditional and quite in harmony with the theological tradition. The new metaphysics, it is true, has given a new and better meaning to the soul, defining it as a spiritual substance; and in doing so it advances a new conception concerning the corporeal in general

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"institution," is characteristic of man alone. Hence it follows that language is inexplicable upon the basis of bodily mechanism alone, for then animals would also have languages due to "institution." Language in this sense implies a principle other than mechanism (De la Forge, pp. 350-54). But Boullier states that Daniel has refuted this argument. De la Chambre urges that "la voix des Bestes se fait avec dessein & intention d'exprimer leurs pensées" (p. 400). De la Chambre denies to animals the power of abstract thought, but imagination, which animals possess, is capable of a certain sort of judgment and of the formation of propositions. Thought in this sense is possessed by animals; their language is commensurate with this capacity of imagination.

[31] Part I, p. 66 ff. For Dilly the hypothesis that beasts are machines implies more artifice than the hypothesis that a soul is attached to the animal body. God, in the case of the animal, dispensed with the assistance of a soul-principle and accordingly showed greater creative competence. Hence the doctrine of the automatism of animals makes for the greater glory of God.

and the human body in particular. The soul, so to speak, is not a speculative conception: but universal mechanism is. Every man, if he attends, must reach at least his own soul as indubitable fact, and he has a clear and distinct idea of it. But mechanism, like the Lockean "way of ideas," is a new thing. And this leads at once to the essential element in Boullier's refutation of the Cartesian. The animals show many indications in their behavior of consecutive activities directed toward an end, representing the ideas, desires, interests and designs of a particular being. Even admitting that many of the stories told concerning animals are mythical, nevertheless enough remains to indicate that animal behavior approximates that of man. The scientific way of looking at these facts is to interpret them by analogy with what we know, and this means to adopt the hypothesis of an animal soul. The theory of animal machines is speculative and metaphysical.

With this a teleological point of view may safely be annexed.

Comme le but général de la Sagesse divine paroît être de raporter & subordonner le Monde corporel aux Intelligences qui se raportent elles-mêmes à Dieu, le but particulier de l'organization d'une certaines [*sic*] portion de matiére doit être de servir à quelque principe immatériel, certainement plus excellent qu'elle: ce que notre ame éprouve dans l'état d'union, nous decouvre le but de l'organization de ce corps qui lui est uni; & de là nous tirons légitimement cette conséquence, que tout corps organisé, toute machine qui se conserve elle-même, est faite pour loger une ame, c'est-à-dire, un principe immateriel, auquel cette machine soit subordonnée comme instrument de sensation & d'action.[32]

Now it must be emphasized that the writer has just urged the essential irrationality of the notion that machines are

[32] Part I, Chap. VI, pp. 79-80.

made for the sole end of conserving themselves as machines. " . . . à quoi bon dans l'Univers des machines qui se conservent elles mêmes?"[33] For our author, mechanism implies a final cause. This, he insists, is obvious with respect to detail. The ear and eye as mechanisms are unintelligible even as mechanisms unless we observe that they are made for audition and vision. What is true of the part is true of the whole—what is the end for which the machine exists? Its self-perpetuation? This is incredible, not because such an answer is teleological, but because it is inadequately mechanistic. The man-made machine is designed for a purpose, and that purpose is in every case specific. But self-conservation is not a helpful element in the effort to comprehend a machine—it tells us nothing specifically concerning its nature as a machine. The body, human or animal, becomes mechanistically intelligible precisely when we can see that it is organized for the accomplishment of a purpose. In the end, so Boullier really thinks, the body is a machine devised to serve the soul. It is the vehicle of sensory information and of muscular adjustments that assure the conservation of the creature of God in its adventurous career amid things. Of course, it might be said with respect to this frame of ideas, that, were the soul not attached to the body, it would be independent of things and immune to their harms and dangers. The soul needs the body only because it has one. Concerning this Boullier has nothing to say. The matter is cared for, of course, by the general mystery of man's existence—that is, the plan of salvation.

We may conclude, then, bearing in mind the wisdom and veracity of God, that there is

une ame dans les bêtes, c'est-à-dire, il y a dans les bêtes, un principe immateriel uni à leur machine, fait pour elle,

[33] *Ibid.*, p. 77.

comme elle est faite pour lui, qui reçoit à son occasion differentes sensations & qui leur fait faire tant d'actions qui nous surprennent, par les diverses directions qu'elle imprime à la force mouvante renfermée dans la machine.[34]

IV

The Nature of the Animal Soul

As our author points out at the very beginning of the second part of his work, new embarrassments await those who champion animal souls. The proponents are in danger of proving both too much and too little. The Peripateticians lay themselves open to the attacks of a Pyrrhonian like Bayle and also to those of the Cartesians. For they urge the existence of a sensitive soul in animals while denying a rational soul. This provides an opportunity for the raillery of Bayle. The Peripateticians think they can explore the souls of animals as the anatomist explores their entrails. They assert a sensitive soul, whereupon the Cartesians triumphantly show that they have proved too much. The latter insist that the inference from animal behavior to a sensitive soul is no more valid than an inference from the same facts to a rational soul. But even the Peripateticians are unprepared to grant a rational soul to animals. If Père Daniel can challenge the Cartesians to show why, on their principles, men are not machines, one may justly demand of Père Daniel that he prove why the sensitive soul he assigns to brutes will not suffice for man.

Boullier insists that the Peripateticians can never refute automatism by recourse to a distinction in the order of kinds of souls. That is to say, Boullier is himself a Cartesian at this point. The term "soul" means spiritual substance, the

[34] *Ibid.*, pp. 84-85.

antithesis of material substance, or it means nothing at all. Boullier agrees with the Peripatetics that animals are not machines. And of course animals are not upon the same order of being as men. But the concept of a "substance mitoyenne entre le corps & l'esprit" (as Guer describes it) will not assist in refuting automatism. In Guer we learn that not even God could create a substance that is neither matter nor spirit. It is of the essence of every being that feels and knows to be spirit, and of every being deprived of knowledge and feeling to be matter. Thus the notion of a substance midway between spirit and matter, endowed with possibility of sensitive knowledge (but not spiritual knowledge), is wholly untenable. To say knowledge or feeling is to say spiritual substance. It is possible to urge that between the knowledge of the beasts and that of man is a difference of degree, and perhaps of great degree. But nevertheless it will not serve to make this distinction. Unless beasts are to be granted spiritual souls, knowledge must be denied them.[35] This is the predicament in which, according to Bayle, the Peripatetics find themselves.

Equally unavailing, as Bayle points out when quoting Pardies, is the doctrine of some writers to the effect that animals possess a soul but that this soul is *material.* If a material soul will explain the activities of brutes, by analogy those of men will be explicable in similar terms.[36] Bayle regards as likewise futile the theory he attributes to Willis, according to which there exist two souls, one corporeal but

[35] Guer, pp. 198-201, 209 ff, 228 ff. Daniel, under the guise of a debate between Aristotle and Descartes, insists that no one has demonstrated that a being midway between spirit and matter is impossible, which all the more makes the plan of the Cartesians to explain animals as machines a chimerical program (*Voyage,* p. 201).

[36] *Dict.,* article "Rorarius," note E.

subtle, and the other spiritual. If the corporeal soul suffices for the animal, it may for man, and all the more since we can imagine that the human soul is even more subtle than the soul of the brute.[37] Bayle is quite well aware that the notion of animal spirits, and of subtle matter, has much to do with the position of those who seek an escape from automatism without becoming Cartesians. He insists that what the "chymists" call "spirits" is as essentially body or matter as are dirt and flesh.[38]

Notions such as those of a corporeal soul, of a "substance mitoyenne," of an additional something adjoined to the animal body are all, for the convinced Cartesian, mere verbalisms. Peripatetician views of souls are reconcilable neither with Descartes nor with Epicurean views of matter. Dilly represents the Peripatetic as defending his notion of the soul by insisting that it contains no difficulty unless one accept "Epicurean" views of matter. Atomism renders unintelligible the relation of form and matter. But if matter be properly understood as Aristotle defines it, *i.e.*, as primary matter, pure possibility (puissance), that is as a being empty, without quality, quantity, quiddity or existence, but capable of receiving all of these, then the Peripatetic view of the soul is intelligible. And the animal soul is not a difficult conception. But Dilly thinks that in escaping the atomists the Peripatetician becomes an easy victim of the Cartesian. For all of this definition of matter is merely an affair of words. Soul and matter are antithetical substances

[37] *Ibid.*, note K.

[38] *Ibid.*, article "Pereira," note E. Henry More's repeated insistence that the soul or spirit cannot be identified with the animal spirits, and that subtle matter is matter and not spirit, is another indication that the confusion was widespread. (*The Philosophical Writings of Henry More*, ed. Mackinnon, New York, 1925, pp. 123, 135, 137).

—and with this there is an end of Peripatetic views and of all intermediary substances.[39]

The Peripatetic view everywhere turned upon a distinction between rational and sensitive knowledge. The Cartesians were quick to perceive that the old distinction must be radically reinterpreted on the new basis. Descartes himself found the primary meaning of spiritual substance in the power of reflection, and in the power of intuiting clear and distinct ideas. But he had, of course, recognized that the definition of matter as extension compelled the inclusion of sensation, perception and imagination with the soul substances as modes of thinking. Boullier, a convinced Cartesian to this extent, recognizes that the similarity in human and animal equipment with respect to the organs of sense is a crucial point. There is a certain reasonableness about the position of Daniel, let us say. Daniel admits that the movements of the blood, heart, and reflexes are mechanical. In general the body is a machine and its peculiar organization contributes to the determination of its motions. But there is also an animal soul, midway between matter and spirit, conferring the capacity for sensation and perception, yet

[39] Dilly, Chap. XIII, XXIV. Bougeant insists that we know of only two substances, and a substantial form which is neither matter nor spirit is an "opinion monstrueuse." An intermediary substance, incapable of reasoning, but capable of feeling and knowing, is a "pure supposition without proof and without foundation," a thing of which we can form no idea whatever (pp. 14-17). Bougeant's own suggestion of a solution to the problem of animal souls is worth noting as the *reductio ad absurdum* of the whole controversy. He suggests that the souls of brutes are indeed spirits; but this can be sustained without conflict with the dogmas of religion, and at the same time the identification of soul and immortal principle can be retained. This is done by the hypothesis that the souls of brutes are demons, fallen angels, whose inclosure within the animal bodies is an indignity constituting a foretaste of the eternal torments of hell to which they are ultimately condemned.

not for reasoning and thought. The soul of the beast is "une substance qui a des sensations, ou des connoissances sensitives sans penser & sans raisonner."[40] Now Boullier, as convinced a dualist as any Cartesian, cannot agree with this manner of assigning to animals a soul. The Peripatetician, insisting upon a sensitive soul and an intermediary substance, at least confesses that sensation is not a bodily or a wholly material and mechanical function. But a faculty belongs either to the soul, and therefore is spiritual, or else to the body, and in this case the term "soul" is completely inapplicable. Either reason and sensation are lodged within the same substance, and are existentially of the same order, or else sensation is a purely corporeal fact, and in no sense can the term "knowledge" be applied to it. If sense organs imply sensation and sensitive knowledge, and if sensitive knowledge implies a soul, then we must conclude that where there is sense there is a spiritual substance. A substance of this kind, being the seat of sensation which is a mode of thought, may just as well comprise a rational faculty also. If reason itself be no more incompatible with matter than sensation, as Boullier urges, then the soul that contains the power of sensation in all probability contains the power of rational reflection also.[41] Boullier is thus led to assert that the brute soul is one that thinks. In his generous eclecticism the influence of Locke seems here to unite with the influence of Descartes. Boullier reinforces the preceding argument by a somewhat hesitant statement that all of the faculties of the soul seem to be "enveloped" within sensation. The soul begins with sensation in infancy, and our author implies

[40] Daniel, *Voyage*, Cinquième partie, pp. 437, 504 ff, 509-10. This part contains the "Lettre d'un Peripateticien, a l'auteur du Voyage du Monde de Descartes" but it is evidently a representation of Daniel's own position.

[41] Part II, Chap. I, p. 90.

that the higher faculties develop from sensation. Referring his readers to Locke, he points out that every sensation comprises a confused idea of an object. Grant the animals the faculty of sensation—a sensitive soul—and you must grant them thought as well. Moreover, you must grant the animals self-consciousness, "le sentiment de leur propre être." Thus our defender of animal souls assigns to animals precisely what constitutes for the automatist a fundamental objection. Dilly, for example, would agree that all physical states are modes of thought. To think is to have activities of whose existence we are immediately certain. We are immediately certain of these acts in and through these very acts themselves, and in the very moment in which we have them. Dilly is attacking Pardies's distinction between material "connoissance" and spiritual "connoissance." Pardies insists that spiritual knowledge is a reflection upon itself, while material knowledge is merely perception: this enables Pardies to allow knowledge to animals. But Dilly insists that the reflective moment in thought is identical with the spiritual experience itself. A percept and the reflective awareness of it fall within one state of consciousness, and so both must be spiritual. Every psychological state, as we should say, involves awareness as an integral element; and awareness, for Dilly, implies the spiritual soul. If we deny self-consciousness to animals—and for Dilly this is obviously necessary—then we must deny them thought in every sense of the term. Otherwise they would be in the peculiar condition of having thought without knowing that they have it.[42]

For Boullier, then, the animal soul is a thing that thinks and it is possessed of "le sentiment de son propre être." This leads us to what Boullier himself recognizes as the crucial difficulty for the defender of a spiritual animal soul.

[42] Dilly, Chaps. II, III, XI, XIII.

The problem is to discover a specific difference between the brute and the human soul. Bayle, as Boullier states, has insisted upon this problem. The skeptics' program is to minimize the difference between the brute and the animal soul, with the result that we shall be driven into a dilemma with equally repellent horns. Thus Bayle urges that ascribing a sensitive soul to brutes fails to provide a specific difference between animals and man. Sensation and perception imply self-consciousness. Then animals possess souls identical in essence with the human. Either man and the brutes are alike machines; or else they possess souls of identical character. Boullier cannot accept even Bayle's suggestion that freedom may define the difference between man and the animals. The meaning of soul as spiritual substance forces Boullier to insist that whatever is a fundamental trait or faculty of the human soul must be present in some measure in the animal. The brutes then possess freedom.[43]

Boullier then confronts the argument that Bayle bases upon observed differences between one man and another, and between animals and men. If the child and the adult, the stupid man and the philosopher, the monkey, the Negro and "un bel esprit Européen" (to use his examples), are alike with respect to soul, then we must look elsewhere for

[43] Bayle, Boullier states, urges that the liberty of spontaneity cannot be denied animals even if we deny them liberty of indifference. His purpose, he adds in a note, is to disclose the chimerical character of the latter notion of liberty by furnishing a Pyrrhonian balance of pros and cons. If liberty of indifference is unnecessary for animals, it can be dispensed with for man, since the souls of man and animals are of identical substance. In this way the dilemma rearises: either there is a substantial difference between the brute and human souls, or the brute soul is a meaningless conception (Part II, pp. 101 ff). If the higher faculty of thought can develop from sensation, then will is an equally possible development from a lower source. "Le seul principe sensitif paroit renfermer un fonds d'activite auquel il ne manque que des idees distinctes, pour devenir un principe libre" (Part II, p. 105).

an explanation of the diversities and inequalities manifest in their activities. But where can we look save to their bodies? Some bodies, we must admit, facilitate the activities of the soul more than others. The fact is that, if we could transpose the souls of the dullard and the philosopher, the latter's soul in the dullard's body would never reveal the philosopher, and the dullard's soul in the philosopher's body would appear to be not the soul of a dullard but of a philosopher. Or, to leave such fancies, Bayle may urge that between the stupid and the intelligent is a difference greater than that between the animal and the stupid man. If the human soul is everywhere the same, we must explain the difference between stupidity and genius by unlikeness of the bodies to which souls are adjoined. Granting this, the difference between animal and man can be accounted for by dissimilarity and inequality of body. This is all the more convincing if the distance between stupidity and genius in man is greater than that between man and the animals—and many of the contributors to the animal-soul controversy would make this admission. We may even go further and allege that a human soul, placed within an animal body, would appear to have all the deficiencies of the alleged animal soul. Thus the Peripatetic's inference from animal behavior to a soul limited to sensitivity may be mistaken: the real fact may be that the animal possesses a quite complete soul, but, cramped by the animal body, is so limited in expression that we mistakenly infer the presence of a more limited soul.[44]

[44] Bayle, *Dict.*, article "Rorarius," notes D, E, and p. 763. Similar arguments are advanced by Guer. Comparisons between animal and brute souls are dangerous. Le Gendre, says Guer, argues that you cannot admit a soul of brutes and insist that it is inferior to the human. This inferiority may obtain in some respects, but in other respects the brute soul may be finer than the human—a thing suggested by animal behavior. That is, an argument based upon the analogy between hu-

Boullier's reply to this argument is to assert that Bayle has drawn a false analogy between extension and spirit. All differences between bodies are mere accidents of one and the same essence, extension. Bodies are composites. But souls are individual unities, simple, indecomposable, and accordingly specifically different every one from another. There is no spiritual substance in general, with thought as its essence. There is a plurality of spiritual substances, and each is an individual. Thought is a generic perfection that each possesses. But souls may possess different degrees of perfection. The essence of each soul is defined, not so much by the generic essence (*i.e.*, thought in general), as by a certain concrete fund of thought and activity that defines the individual substance.

Ainsi dès que l'ame de la Bête a quelque pensée, elle convient avec celle de l'homme, dans l'attribute general de pensée, . . . mais elle en différe par des proprietez specifiques, & parce que le fonds de pensée & d'activité qu'elle renferme est beaucoup plus petit que celui de l'ame humaine.[45]

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man and animal activity is double-edged (Guer, pp. 138 ff). The difficulty may be presented in another way. Either the soul has some efficiency and real function, or it has not. If the former, bodily activities depend upon it. Now the acts of brutes are similar to those of man. If human activity expresses a soul, so does the activity of the animal. But, if animal acts go on without a soul, then we should conclude that the human soul is there in man but without efficiency. The correlation of body and soul in man can then be explained neither in terms of the character of the body nor of the character of the soul. The automatists are thus driven to God for an explanation of the union of body and soul, which is extremely dangerous, since God thus becomes responsible for our actions (Guer, pp. 258 ff).

[45] Part II, Chap. III, p. 115. The arguments of Boullier against Bayle are quoted with approval by De Crousaz, in *Examen du Pyrrhonisme Ancien & Moderne*, par M. de Crousaz, de l'Academie Roiale des Sciences, Gouverneur de Son Altesse Serenissime Le Prince Frederic de Hesse Cassel . . . a la Haye, Chez Pierre de Hondt, MDCCXXIII, Part III, Sec. 10, pp. 480 ff. De Crousaz maintains a position quite similar to that of Boullier.

Here then we have the reintroduction of the medieval hierarchy, the scale of beings from matter to God, within the system of Cartesian soul substances. Above the vast monotony of extension, wherein all differences are mere accidents, there stands a system of souls that participate in the attribute of thought in an infinite number of ways; and according to differences of participation each of these souls possesses capacities for perception and thought unlike those of any other. We have here an order of intelligences, from the lowest brute to the most gifted man—and beyond man are the angels. Each individual soul, fixed within the limitations defined by his specific difference, may exploit more and more fully his capacity, but always within the restrictions of these limits.[46]

The animal mind reveals its limitations in this, namely, that it cannot possess "idées spirituelles & abstraites" and is not "susceptible" to the idea of a God, of a religion, of the morally right and wrong; nor does the animal soul possess the ideas and principles upon which the arts and sciences are founded.[47] These deficiencies are proved by ex-

[46] In Part II, Chap. IV, Boullier uses this point to refute Bayle's (conjectural) extension of an argument of Addison's to the effect that each soul may by proper exercise become in time a higher soul, taking a place on a higher rung of the ladder. But for Boullier the perfecting of the soul can occur only within the limits set by the specific constitution of the individual soul. Otherwise, he insists, if we admit that a soul capable of thought is capable of such development as to comprise all thought, we shall be obliged to admit the potential equality of a human and the divine mind (Cf. p. 128). In short, our author attributes to Cartesian souls the fixity of the species and also a certain singularity definitive of the individual soul, while this places limits upon its perfectibility.

[47] Part II, Chap. V, pp. 134-35. ". . . Il est possible qu'un Etre ait des sentimens, ait des perceptions, & s'appercoive qu'il les ait, sans avoir reçu la Capacité de réfléchir sur ces Perceptions, pour avoir soin de les mettre dans sa Mémoire, pour s'informer de leurs Causes, pour remorter à leurs sources, ou pour en prévoir les suites, & prendre là-dessus des mesures." De Crousaz, *op. cit.*, pp. 481-82.

perience. Again the objection arises—and the figure of the Pyrrhonian Bayle is in the background—are these deficiencies due to the restrictions placed upon the animal soul by its body? And once more emerges the real basis of Boullier's doctrine: this suggestion, if admitted, will imply a blunder on the part of God. The craftsmanship of God implies that he does that which is fitting, and therefore he assuredly furnishes for every type of soul a set of bodily conditions appropriate to and suitable for the effective exercise of that soul. In this sense indeed, although our author does not state the point specifically, the study of the particular animal body will indicate the character and limitations of its soul.

We still remain without a definition of the nature of the animal soul. We know that the animal soul is (1) spiritual substance; (2) a thing that thinks; (3) that it is incapable of "spiritual" and abstract ideas; (4) that it is duly proportioned to the body and the body to it, *i.e.*, that each is suited to the other; (5) and finally that the animal soul possesses in some degree each of the faculties of the human soul. But how is it that the thing that thinks cannot form abstract ideas? In what sense does the animal soul possess the faculties of the human soul, and yet is in principle incapable of a range of ideas and volitions characteristic of the human soul?

At this point Boullier beautifully illustrates the process of syncretism that is typical of the age. On the one hand the Cartesian dualism has defined the situation so that a psychological function is either lodged in the spiritual substance or else it is not psychological at all but corporeal and mechanistic. There is no middle term. On the other hand, since the soul is spiritual substance and one thing, and since its essence is thought, everything within the soul is either

thought or is potentially thought. Again, the physiological conditions of sensation seem quite analogous in animal and in man. In addition to all this, Boullier has studied Locke and thinks that Locke provides us with a natural history of ideas in the soul corresponding to things outside. Finally, the unity of the soul substance, the essence of which is thought, has forced Descartes to look upon sensations and perceptions as thought, but with the reservation that they are *confused* thoughts. These factors Boullier uses—we need not inquire with what consistency—to define a situation in which he can reintroduce the conception of the sensitive soul, and thus define the animal soul by preserving the intermediary character of the older conception while adjusting it to the conditions defined by the Cartesian dualism. We therefore discover that the animal soul is a sensitive principle, an immaterial thing, a thinking substance—"en un mot, un esprit qui n'a que des perceptions confuses & dont l'activité est modifiée & reglée sur ces perceptions, c'est-a-dire, qu'il a divers desirs confus qui correspondent à la varieté de ces sensations & dont elles sont en quelque sorte l'objet."[48] Moreover, because the animal soul is a sensitive principle, its relation to the body is so necessary for its activity that it cannot exist without the body. Significantly enough, Boullier then declares that in order to appreciate his hypothesis, the reader must follow him through a long "digression" concerning the nature of sensation. If the animal soul be the sensitive soul, then in sensation must be found that which at one and the same time provides the likeness of human and brute souls and provides the difference between them.[49]

[48] Part II, Chap. VI, p. 140.

[49] The digression occupies pp. 141-74 of Part II. It is considered in Appendix A.

What then is the character of the brute soul? The soul of man possesses the faculties of clear and distinct ideas and also of confused ideas, of sensation. The faculty of will, acting upon the faculty of forming clear and distinct ideas, leads to the activities of reflection, judgment, reasoning, and free choice. The animal soul, possessing the faculty of sensation only, is incapable of clear and distinct ideas. "Vous voyez donc qu'une ame qui ne seroit capable que de sensations ne ressemblera à l'ame humaine que par les attributs inséparables de toute intelligence, & qui doivent nécessairement entrer dans l'idée générale d'une substance qui pense."[50] Strictly speaking, the animal soul does not possess the power of choice, or volition. Nevertheless, "Dans toute substance qui pense il y a toujours quelque chose d'analogue à l'entendement & à la volonté."[51] The animals, Boullier seems to imply, possess confused desires and impulses that are the analogue of the human acts of will. The animal soul perceives things by means of sensation. But with man the faculty of clear and distinct ideas adds to (or transforms?) the sensations from things, and this is beyond the capacity of the animal soul. Distinctness of percept, that is the percept of the thing as an organized whole, is due to the higher faculty in man. What Boullier seems really to mean, is that man alone can perceive, while animals possess sensations without the capacity of organizing them into perceptions of objects.[52] The animal, being incapable of reflection, is incapable of virtue or of vice, of memory or of anticipation.

Throughout the discussion Boullier is obviously troubled by the fact that the animal's behavior seems to imply

[50] Part II, p. 176.
[51] *Ibid.*
[52] *Ibid.*, Chap. VIII, p. 180.

precisely these powers of reflection, foresight, and will. Boullier meets the difficulty in two ways. On the one hand, wherever animal behavior suggests reflection and knowledge in the eulogistic sense, we may be certain that the mechanism of the body is responsible for such behavior. The divine designer, so to speak, may secure certain types of activity in either of two ways: in the case of man, by means of a soul capable of the higher levels of thinking; in the case of the animals, by means of mechanism. On the other hand, for Boullier sensation is thought. In so far the principle that whatever is in the human soul must have its analogue in the animal is satisfied. Sensation, however, is confused thought, and therefore is not reflective knowledge—thought in the emphatic sense. In this way the animal may be denied reason, but nevertheless we may say that the soul of the animal is a substance whose essence is thought.[53]

The real difficulty in this situation is teleological and theological. The opponents of automatism were not slow in grasping the opportunity. The argument is developed as follows: animals suggest by their activities that they are endowed with the capacity to remember, to learn by experience, to exercise foresight and to plan for the realization of ends. In short, they display intelligence, a power for thinking that is something more than susceptibility to sensation. But if animals do not possess souls, while their behavior certainly suggests that they do, then God is a deceiver. We persistently believe that animals are not machines at all. The argument appears again and again. Dilly answers Pardies' use of the argument by insisting that the error is man's, and God is not responsible for it—employing the Cartesian account of error.[54] But the argument can be inverted, and

[53] *Ibid.*, p. 181.
[54] Dilly, Chap. X; Guer, p. 302.

Boullier does this. It is equally valid to argue that, since God does not deceive, and since animal behavior forces us to the conclusion that animals possess souls whose essence is thought, it is legitimate to believe the conclusion. The trouble with the whole question, as Boullier's treatment reveals, is in restricting the scope of the argrument so as to exclude the inference to reflection and clear and distinct ideas as powers of the animal. The manipulation of ideas is so characteristic of the whole controversy concerning the brute soul that it is worth while to add a comparable situation which Daniel puts into the mouth of his Peripatetician:

> . . . les bestes agissent, comme si elles connoissoient, comme si elles sentoient, comme si elles raisonnoient: Cela prouve rien selon vous. Les hommes parlent comme s'ils connoissoient, comme s'ils sentoient, comme s'ils raisonnoient: cela ne prouvera aussi rien selon moy, parce que cela doit ne rien prouver selon vous.[55]

The facts concerning animal behavior that give rise to the difficulties we have been considering are the activities of advance adaptation and the guidance of action toward remote ends. The facts must be allowed for without an encroachment upon human prerogatives. The question is complicated by the necessity of providing for some measure of efficiency in spiritual substance with respect to the control of the body. Boullier insists that the hypothesis of a sensitive (spiritual) soul, joined to a machine, suffices to explain the facts of animal behavior. Rational powers need not be attributed to the soul of the brute. But the facts do demand something more than a machine. The machine, of course, embodies the wisdom of the Creator. Within the design of the Creator, however, and indeed as a part of that design, the sensitive soul in the brute is necessary for the initiation and

[55] Daniel, *Nouv. Dif.*, p. 84.

redirection of movements. Just as the similarity and the difference of the brute and the human souls are defined by the difference between the confused and the clear percept falling within sameness of substance, so the distinction between the two orders of spirits is defined by the difference between confused and clear volition.[56] As sensations are confusions of minute perceptions, so the confused desires of animals are "une multitude ou suite de petits efforts," and these are exactly analogous to the various "suites" of minute ideas. By the wise provision of the Creator some of the animal's perceptions are associated with pleasure and some with pain. Given all this,

> Il ne faut plus autre chose, si ce n'est que le Créateur ait tellement ajusté les ressorts de cette machine faite pour l'ame de la bête, que les désirs confus qui correspondent aux sensations douloureuses ou agréables, produisent dans le cerveau diverses impressions lesquelles, en vertu de la structure générale, feront mouvoir la machine d'une maniére propre à éviter la cause de la douleur, & à s'unir à celle du plaisir.[57]

God would not provide for the action of the body upon the soul without providing for the action of the soul upon the body. A machine by itself could have no "interest," and nothing could with propriety be regarded as useful or injurious to a machine.[58] Given the sensitive soul, however, the brute is by nature something that will take account of the useful and the injurious. Pleasure and pain, as passions, would not exist at all in a mere machine. Their appearance in the sensitive soul attached to the machine would be unintelligible unless those feelings were effective in guiding the machine. The sensitive soul will then direct the activi-

[56] Cf. Appendix A.
[57] Part II, Chap. VIII, p. 188.
[58] *Ibid.*, p. 190.

ties of the animal machine in conformity with the associations between pleasure and pain and the sensations. This process of association occurs in accordance with the reciprocal harmony, the inner adjustments, which define the artifice of the Creator in uniting with the animal body a sensitive soul.[59]

Since the arts and sciences depend upon distinct ideas and universal principles, the animals are incapable of them. In the strict sense of the term, then, animals do not reason.[60] But if animals do not reason, how is it possible to explain, or explain away, the appearance of reasoning found in animal behavior? Boullier states that there are three classes of activities which are commonly cited as evidence of reasoning power: the activities of instinct, the "docility" of animals, and certain activities of adjustment to specific conditions which do not seem explicable in terms of either instinct or habit.[61]

The phenomena described by the term "instinct" caused a great deal of discussion in the brute-soul controversy. Remarkably enough, instinct is often conceived of in the same way by those who oppose and those who advocate automatism. The automatists and the anti-automatists, in many cases, agree that instinct must be regarded as a case of mechanical adjustment. Dilly states that instinct is a set of actions that every member of a species does naturally; instincts invariably make for the conservation of the animal; the instinct consists only "dans la disposition particuliere" of the animal's brain at birth.[62] The animal automatists then dispose of the case of instinct as of any other animal power: instincts are factors in the mechanical design of the Creator.

[59] *Ibid.*, pp. 186-87.
[60] *Ibid.*, Chap. X.
[61] *Ibid.*, Chap. IX, p. 196; Chaps. X, XI.
[62] Dilly, Chap. XIX, p. 177.

Their place in the economy of the machine is defined by their serviceability in the struggle for existence. Now many of the anti-automatists, agreeing in essentials with the automatists' description of an instinct, are equally positive that it is a portion of the bodily machine. Their reasons for this, however, are somewhat different. The perfection of adjustment involved in what is called instinctive behavior cannot be attributed to the soul without grave danger. For, if instinctive behavior is due to mind, then the remarkable achievements of animals would imply a power of reasoning quite superior to that possessed by man. The advocate of animal souls must then agree with the automatists that instinct belongs essentially to the body. There is abundant evidence to show that this objection to assigning instinct to spirit was a commonplace of discussion in the controversy, and a commonplace of serious weight. An eclectic, such as Du Hamel, is driven in both directions. Instincts are related to the goals that the Creator has fixed for animal life: procreation, care of the young, self-maintenance. Instinct cannot be due solely to atomical arrangement or mere stimulation: the inner organization of the animal must be involved. But on the other hand, the instinctive process involves knowledge, for it is augmented by sense-experience—and how can there be sense-experience in the absence of a soul? Du Hamel in the end leaves us perplexed. He can only conclude by warning us not to put the animals on a plane with man, or to make them only a shade inferior to man, or to concede them liberty and free will.[63] If instinct be due to reason, freedom of will would be implied. And since instinctive activity is the very perfection of art, infallibility would have to be granted to the beasts. Boullier, although upholding a spiritual substance in the brute, cannot of course ad-

[63] Du Hamel, *De corpore animato,* pp. 320-31.

mit such consequences. If animals are endowed with such perfection of thought as instinct would imply, the integrity of the Creator would be open to suspicion. A certain moral obliquity would be chargeable to God. For if animals have this endowment, then in brutes the gift of reason is subordinated to ends that are purely "animal," *i.e.*, to nutrition and propagation. But this is unworthy of the Creator, for a rational soul cannot be intended to subserve the gratification of merely bodily desires and the mere conservation of life. Hence instinct must be a bodily power, and adaptation to the conditions of bodily life its function, *i.e.*, its purpose according to the divine plan.[64]

On the other hand, it is quite worthy of the Creator's goodness to attach to the animal body a *sensitive* soul. It is true that the animal body is made for the service of the sensitive soul; but the animal as a whole is made for the good of the universe. The brute soul, although in a sense blind, is nevertheless an immaterial agent arranging the diverse parts of matter and forming of them an organized whole. The soul of the animal, it is clear, is necessary as a principle of organization: it remains, at bottom, the organizing form of the Peripatetic.[65] Pleasure and pain are the guiding factors in the sensitive soul, and are therefore just the conditions that enable the soul to organize the life of the animal.

In a similar fashion, Boullier concludes that the docility of animals even less demands the attribution of reasoning power to them. Learning implies something more than the body machine, for mechanism may explain habit but not its formation. As with intelligence in man, so in the brute a duly proportioned principle of correction is needed. The

[64] Part II, Chap. IX, pp. 197-99.
[65] *Ibid.*, pp. 207-09.

effects of new objects upon the body, and thence upon the sensitive soul, together with the effects of the latter upon the body, produce new traces in the nervous system. Learning builds up new mechanisms upon the mechanisms of instinct. With this view of instinct and learning, neither too much nor too little is granted to the brute.[66]

V

Objections and Replies

In the twelfth and thirteenth chapters of the second part, Boullier seeks to refute a class of objections to the doctrine that animals possess sensitive and spiritual souls. This class of objections consists of those which govern the whole controversy: they depend upon certain theological ideas. Their refutation, like the objections themselves, reflect not so much the advance of science as the reconciliation of new metaphysical and scientific ideas with tradition.

Descartes had taught men to understand by "soul" a spiritual substance. Wherever the Cartesian influence reigned, there the term "soul" meant spiritual substance, the essence of which is thought (as reflection, as conscious experience, as immediate experience), or else the term meant nothing at all. Moreover, spirituality meant immateriality, and since immateriality meant indestructibility, immortality was implied. The immortality of the animal soul seemed to follow from its nature as spiritual substance—and Cartesian anti-automatists, such as Boullier, and Peripatetic

[66] Part II, Chap. X. As for the third class of acts, alleged to be inexplicable either by habit or instinct, Boullier dismisses them on the grounds of inaccurate observation and our failure to appreciate the possibilities of mechanism, particularly when we fail to remember that mechanism means divine design. Boullier extends mechanical explanation wherever it suits his purposes. Cf. Part II, Chap. XI.

opponents of Cartesian ideas were at one in recognizing the danger of this conclusion. The immortality of the brute soul is an opinion "trop choquant & trop ridicule aux yeux da la Raison même" to be acceptable.[67] Moreover, it is proscribed by authority. But either the animal soul is immortal or it is not: if it is not, but is identical with or at least similar in essence to that of man, then human immortality is endangered. If the human soul be not immortal, and yet it is a spiritual substance, then spirituality and immateriality do not necessarily imply immortality. But with this we lose the fundamental metaphysical proof for the immortality of the soul, and one of the most striking claims of the new philosophy to respectability is dissipated.

The recognition of the difficulty was widespread. Guer characterizes the consequences of attributing a spiritual soul to brutes as "effrayantes," and Bayle somewhere describes them as "horrid." It is impossible to doubt that one reason why Peripatetics clung to the sensitive soul, capable of feeling and perception, while denying the applicability of the Cartesian definition of the spiritual soul, was precisely the belief that only in some such way could the proscribed consequences be avoided. Bougeant says this in so many words.[68] Moreover, the difficulty was apparent to very early followers of Descartes. Pierre Sylvain Régis describes the predicament that the choice between the animal soul and automatism brought about.[69] He insists that Cartesian dualism rendered impossible any escape by searching for

[67] Boullier, Part II, Chap. XII, pp. 226 ff.
[68] Bougeant, pp. 13-14.
[69] *Systeme de Philosophie, contenant La Logique, La Metaphysique, La Physique, et La Morale*, Paris, MDCXC, Tome II, Livre Septième, Partie 2, Chap. 17, pp. 631-632. In connection with Régis, I must express my indebtedness to the as yet unpublished dissertation on Régis of Mr. F. F. Swertfeger.

a middle ground. Nothing is more unreasonable than to attribute to brutes a soul that is a substance really distinct from the body while at the same time maintaining that it cannot exist independently of the body. For this would be the same thing, says Régis, as the assertion that the brute soul is both a substance and a mode, an independent existence and also an attribute depending upon a subject for its existence. It is equally idle to define it as an incomplete substance. The brute soul would then be either incomplete in itself, or incomplete in relation to the composite of soul and body. If the former, it is not a substance, for it is of the essence of substance to exist by itself. If the latter, it cannot be incorruptible and therefore cannot be spirit. Finally, says Régis, the doctrine that the brute soul is a substance distinct from the body but of a nature different from the human soul is a perfectly empty hypothesis. It is quite remarkable to note, in Régis and others, how unquestionable is the Cartesian dichotomy of things. One after another agrees with Régis that the mind simply cannot think the thought of a thing which is neither spirit nor matter. As for those who say that the brute soul is veritably a substance that thinks, is distinct from body and can exist independently of it, we must see that this doctrine cannot be proved. Animals, that is, cannot speak, they cannot give us assurances of an inner spiritual experience. Moreover, if we dally with such an idea we must accept the consequences, and the consequence of primary importance is the necessary immortality of the soul of the animal. It is especially this consequence that leads Régis, despite his fidelity to Cartesian doctrine, to the cautious conclusion that, whatever "penchant que nous puissions avoir à donner aux bêtes une âme distincte de corps, nous aimons mieux suspendre notre jugement à cet égard." The conception of the animal as an

automaton should be taken as a working hypothesis only, and this all the more because of the patent success of the hypothesis. Régis, in short, expresses the discovery that the Cartesian principle of automatism defines a predicament for which no solution comes to mind.

Boullier's efforts to escape from the predicament is a beautiful expression of the artifices adopted for the reconciliation of the old and the new. In the first place, the *certainty* of immortality is given only through revelation; to this reason can indeed add probabilities of a high order, but nothing more. So revelation and rational probabilities agree in showing that God plans human but not animal immortality. But why does reason indicate the improbability of animal survival? This survival remains possible, but it is improbable precisely because the immortality of the brute soul would be derogatory to the work of the Creator. For the soul of brutes, being purely sensitive, possesses only functions narrowly limited to the body. Its dependence upon the body is so close that, so Boullier really thinks, its immortality is out of the question. We could assign no content for an eternal life of a merely sensitive soul. The matter may be stated in another form: God has made the brute soul to go with the animal body; they are so closely proportioned that the soul can have no function save in strict connection with the animal machine. In addition we must recognize that the brute soul can neither think the thought of immortality nor desire it. It would be incredible that God would give to the soul an end which it was incapable of entertaining in thought.[70] Anthony Le Grand, the apostle of Cartesianism in England, states the situation in this way:

. . . supposing the *Souls* of *Beasts* to be *Spiritual* and *Indivisible,* it will follow that they are also *Immortal;* Neither is there any *Argument* drawn from the *Light* of *Reason,*

[70] Part II, Chap. XII, pp. 233-35.

whereby we can prove the *Immortality* of *Human Souls,* which will not as well prove the same concerning the *Souls* of *Beasts.* Besides, if we allow *Knowledge* to *Brutes,* we must also make them capable of *Religion;* for to imagine a *Knowing* or *Thinking Creature,* without being under an obligation to obey *God,* and pay *Religious Duties* to him, is repugnant. For if the *Souls* of *Beasts* be *Knowing,* they will in the first place know themselves; and it is impossible but that by knowing themselves they should be led to the *Knowledge* of their *Creatour.* Which Opinions would pave a ready way to *Atheism.*[71]

Immortality must remain the prerogative of man. The medieval picture of God, Man, and the World provides still the framework within which Cartesian ideas must be envisaged. The human soul lies between the angel and the beasts, joining clear ideas and the confusions of sensation; akin to God in substance, it must work out its salvation in a momentary alliance with a bodily machine. The world of matter is there according to the divine plan, for the use, for the contemplation, of spiritual souls. Even sensation, in the providence of God, constitutes a part of human happiness: from this, indeed, Boullier thinks, we may perceive that the dogma of the resurrection of the body is comprehensible to reason.[72] But the destiny of the brutes must not be confused with the destiny of man. If, however, we are led to allow the immortality of the brute soul because of its spiritual nature, our conclusion would be virtually a denial of the Creator's whole plan of salvation. Boullier secretly fears, one suspects, that the immortality of the animal soul would imply equally the resurrection of the animal body.

The question of immortality is intimately related to another problem that the spiritual animal soul raises. A second set of objections, based upon ethico-theological grounds,

[71] Le Grand, pp. 255-56.
[72] *Ibid.,* Chap. XVII.

must be refuted. These are, in effect, the "effrayantes" consequences to which Guer refers.[73] How can we escape attributing moral responsibility to the brutes? How are the sufferings of brutes to be reconciled with the goodness of the Creator? What meaning can pain have in the case of brutes? Were they machines, they could not suffer. But their endowment of sensitive souls means that pain is a part of their lot. Now the controlling maxim is: "Sous un Dieu juste, on ne peut être miserable sans l'avoir merité." The maxim, Boullier states, is so fundamental that it should be regarded as "une loi éternelle de l'ordre."[74] The meaning of suffering and pain is moral; it is a part of the general proportioning of things by the Creator. To suffer is to indicate demerit. But the brutes suffer, and yet they do not merit punishment, for they are not moral agents. Boullier's reply to the difficulty is first of all denial that conceptions of merit and demerit have any applicability to life below the human level. The maxim applies only to rational souls capable of virtue and of vice. But there is of course the wider difficulty, to the effect that suffering on the part of the animals is a blemish upon creation. To this our author replies by saying that the physical suffering of brutes—and of course

[73] Guer, pp. 142 ff. Guer tells us that one Le Gendre proposed as alternative hypothesis that the souls of beasts at death go into other animal bodies, or otherwise that we believe the souls of beasts to fall into nothingness, on the grounds that such souls were created by God just to endure through the life of the animal body but no longer. Guer recounts the arguments drawn from the undeserved sufferings of beasts (pp. 175 ff).

[74] Ibid., Chap. XIII, p. 243. Dilly argues to automatism from the same principle. The fact that, were beasts to possess souls, they would suffer without desert, constitutes a proof that they are machines. In the case of man immortality is the compensation for suffering and so the goodness of God is saved. But either we must posit the immortality of animal souls as compensation for their sufferings or must deny that they have souls and therefore deny that they suffer.

there is no other sort—is incidental to the regularity and systematic character of the world. Suffering is incidental to the comprehensive plan of God.[75] The preservation of the brute, and its pleasures, depend upon conditions which at the same time involve the brute's sufferings. The laws of nature would have to be suspended from time to time were the brute to obtain pleasure and always avoid pain. In any case, Boullier insists, could we penetrate the animal soul we should find there a surplusage of pleasure. The objection takes another form: is it right that creatures possessing spiritual souls, even if limited to sensitivity, should be subjected to the use and even to the nourishment of man? But all bodies exist for the use of the spirit. The question therefore becomes this: is the human soul sufficiently above that of the brute so that the instrument of the animal soul, *i.e.*, the animal body, can properly be utilized as an agency for the support of the instrument of the human soul, *i.e.*, for the human body? And finally, is it right that this employment of the animal should bring to an end the spiritual principle adjoined to the animal body? Again the reply is a recognition of the divinely established order of things. In the divine proportioning of the order of things the lowlier animal, endowed with the lowlier soul, is a means for the higher animal endowed with the higher soul; and in turn the whole order of life subserves the life of man in order that the bodily life of man may support the life of the immortal soul. And if, in the midst of this system of relations, the spiritual principle of animals is annihilated by the infliction of death, this is no blemish upon the system.

L'anéantissement n'est point un mal pour une creature qui ne reflechit point sur son existence, qui est incapable

[75] Part II, Chap. XIII, pp. 250 ff.

d'en prévoir la fin, & de comparer, pour ainsi dire, l'être avec le non être. . . . La mort à l'égard d'une ame sensitive n'est que la soustraction d'un bien qui n'étoit pas dû; ce n'est point un mal qui empoisonne les dons du Créateur, & qui rende la créature malheureuse. . . . Enfin, nous n'avons qu'à nous dépouiller une fois pour toutes de ce prejugé, qui, lors qu'on nous parle d'un principe spirituel, nous y fait attacher d'abord cette foule de proprietez excellentes qui se trouvent dans notre ame, & qui la qualifient pour l'immortalité. . . . Nous n'avons qu'à nous bien représenter differens ordres de substances immaterielles qui s'elevent les unes sur les autres presques à l'infini, pour peupler, pour animer, pour orner les differentes parties de ce vaste Univers, alors nous admirerons le plan de la souveraine Sagesse, & nous verrons se changer en des clartez ravissantes ces tenébres même qui nous effrayoient.[76]

The controversy concerning the soul of the animal is an incident in the formation of the modern philosophical tradition. Over a considerable period philosophers were busy with the question. One way of defining a philosophical problem is to point to the questions upon which philosophers expend great effort. If this be a test, then the problem of the existence or the non-existence of the animal soul, and of the nature of the soul, if brutes do possess such a thing, was a genuinely philosophical problem. Connected with the problem are ideas that have had a history. The controversy appears to us today somewhat quaint and unreal. The past tense, in referring to it, seems quite appropriate. There

[76] Part II, Chap. XIII, pp. 259-60. It should be added that in Chaps. XIV-XVI our author considers the problem of the relation of mind and body. He gives an account of what he calls the Occasionalistic system (perfectionné by Malebranche he says), of the system of "pre-established harmony" of Leibnitz (the system of spiritual automata, it is called), and finally the doctrine which assigns to the soul the power to move matter. This last, Boullier thinks, is the most ancient and most reasonable of all; but his doctrine of the animal soul, he believes, is compatible with each of the three systems.

is something artificial in asking how an animal can possess a spiritual soul and nevertheless not be destined for eternal life. Thus we may look upon the whole controversy, upon its issues, its arguments, and its oppositions of ideas, with complete detachment. Our interest in its analysis is very much like the interest with which we study a game that has been played, that is over and done with. This incident in the history of ideas we may regard as closed.

Upon further reflection, however, this conclusion may render us uneasy. If we dismiss the controversy concerning the soul of the brute as unreal we begin to suspect that a similar judgment concerning issues of today would be equally justified. The more we linger over the details of the animal-soul debate, the more strongly are we reminded of arguments and issues that have not yet become merely historical. It would be interesting to attempt an experiment. This experiment would consist in translating the debate of Boullier, Dilly, Pardies, and the others into current terminology. Translation, of course, can never be literal; and since ideas have a history, the issue itself would undergo some alteration. But on the whole the general pattern of the conflict of ideas would remain. Peripatetic forms may not appear in the new picture, but entelechies would take their place. After one side of the debate has been pushed to its appropriate extreme, and man too has been declared to be a machine, the problem will have lost some of its historical remoteness. Perhaps it is prudent to refrain from pushing the experiment any further. It is enough to indicate that even today there are many who cling tenaciously to the economy of explanation which so appealed to Dilly, or hesitate with Guer before consequences that seem "effrayantes," or would like to see, with Boullier, "se changer en des clartez ravissantes ces tenébres même qui nous effrayoient."

APPENDIX A

BOULLIER'S ACCOUNT OF SENSATION

Boullier's treatment of sensation seeks to combine Cartesian principles, Lockean ideas, and a doctrine of "petites perceptions" derived probably from Leibnitz. The question of the nature and epistemological function of sensation is forced upon Boullier by his predicament with respect to the animal soul. Sensation must possess a knowledge function, for it is resident in the soul whose essence is thought; moreover, for everything in the human soul there must be something analogous in the animal soul. Knowledge is in some measure a function of the brute. The highest levels of knowledge must be denied the brute, however, or else all distinctive difference between the two varieties of spiritual souls will be eliminated. The sensitive soul of the brute, moreover, must possess a genuine function or God's creativeness is deceptive.

The escape from the first predicament lands Boullier in a second. The rationalistic view makes a radical distinction between thought (the clear and distinct idea) and sensation. The latter is in terms of logical character and epistemological value confused and in so far not knowledge at all. But sensations are nevertheless thoughts in the soul; and the latter's essence is somehow defined by the capacity for knowledge. On the other hand, in the psychological sense, sensations are clear and distinct; each is qualitatively what it is, just this red, this taste, or this feeling of dizziness. The distinctiveness of sensation provides no guarantee of epistemological value.

This defines a dilemma for Boullier with his doctrine of an animal spiritual soul substance. How are clear and distinct ideas of the understanding related to the confused ideas of sense? If clear and distinct ideas are potentially in sense ideas—if sense-ideas can somehow develop into or be developed into clear and distinct ideas—then animals really possess knowledge. But then they possess in potency the highest type of knowledge—thought in the eulogistic sense—and this threatens the distinction between man and the animals. On the other hand, if sense ideas and the ideas of understanding have independent sources, the animals are limited to sense-ideas. Strictly speaking they have no knowledge at all. Then there is a radical difference between the souls of men and of animals. If sensation have no knowledge function, then *what* function can it have? If it be a mere incident in the chain of stimuli-reactions, we might as well drop it entirely, with the result that automatism seems a satisfactory explanation of animal behavior. With this would fall the scheme of explanation based upon God's providence. Finally, whatever the source of clear ideas, knowledge of the external world depends on sensation. For animals especially, that certainly have no knowledge of a spiritual world, the object of knowledge is the external world of things. We—and presumably the animals—inevitably attach to things the qualities of sense—*i.e.*, the confusions of sensation.

The situation is that we must preserve a distinction between the clear and distinct ideas of understanding and the confused ideas of sense, despite a Lockean natural history of ideas; we must preserve a genuine knowledge function for the ideas of sense; we must discover a trustworthy connection between the sense-perceptions and the things of the world which they in no way resemble in order that the providential arrangement of animal life may be indubitable. With all this it must be possible still to maintain that the essence of spiritual substance is

Boullier turns to the conception of "petites perceptions." Our ideas are either simple or compound. The simple idea is in one sense a logically simple entity. But sensations are confused. They do not reveal anything of the real nature of the material object which causes or occasions sensations. In God's providence the correlation of sensation and thing (or physiological perceptual process) is fixed and regular. Sensation, as thought, discloses nothing at all concerning this objective correlate. But sensation, precisely because it *is* thought, ought to make such disclosure. Now sensation is an "assemblage" of "petites perceptions" that follow one another so rapidly and in such number that the soul is unable to distinguish them. The ("psychological") distinctiveness of a sensation is due to the different blurrings of two different sets of minute perceptions. In correspondence with the minute perceptions are "petits mouvemens" communicated to the nerves. The soul is present in, or compresent with, the sensorium where the movements from without terminate.

Two observations must here be made. First, Boullier expresses himself in two quite different ways concerning the minute perceptions. At one time his language suggests that the "petits mouvmens" are physiological, while the blurring or telescoping of these *is* the sensation itself—in which case the blurring occurs in the soul. At another time he suggests that there corresponds to every minute movement a minute perception in the soul; and the blurring of the minute perceptions within the soul is the sensation. In the second place, the distinction between the clear and distinct as against the confused idea is here connected with the notion of a Lockean simple idea. The sensations, being in the soul and being thought, ought to be clear, but are not. But the sensations's confused character may be due to its nature as a blur. If then we assume that the minute perceptions are in themselves and in principle clear and distinct, they possess the properties belonging to thought. But since we cannot perceive the minute perceptions, but only a series telescoped into a blur, the confusion of sensation may be maintained with the essential clarity of thought. If the blurring did not occur, if the soul were capable of taking cognizance of each minute perception, then sensations would be identical with minute perceptions and each would be a clear idea representing a particular minute movement. It would be true that the sensation would represent unambiguously the minute movement which is its correlate (cf. Part II, Chap. VI, pp. 152-53, 156-58). Our ordinary perceptions

are combinations of pure ideas and sensations. Thus, if I perceive a red circular area, my cognizance of its circularity is due to the clear idea, and that of the red color is due to the "suite rapide de petites secousses" which is the correlate of and the occasion of the sensation (cf. p. 167).

Boullier summarizes his "hypothesis" as follows: "Notre ame entant qu'Etre intelligent, peut avoir l'idée des corps, sans être unie au Monde matériel, sans qu'il soit besoin de supposer que ce Monde existe. Mais posé l'existence de ce Monde, l'ame connoît ce Monde existant, & lui est unie par les sensations que Dieu lui donne. Les sensations sont des idées représentatives de ce Monde existant, non précisément tel qu'il est en lui-même, mais dans son raport a une portion de matiére organisée sur laquelle les différens objets corporels font diverses impressions. L'ame est rendue présente à ce corps organique, par l'idée confuse que Dieu lui en donne, & par son aplication immédiate continuelle & involontaire à se représenter un certain endroit du cerveau apellé le *Sensorium,* auquel aboutissent tous les nerfs. . . . L'ame réunissant son attention sur cet organe, aperçoit, ou plutôt sent distinctement, toutes les diverses modifications de mouvement qu'il reçoit. L'union de l'ame au corps consiste moins dans l'action par laquelle elle se meut, que dans cette perception involontaire & continuelle qu'elle a de tout le corps par l'entremise du *Sensorium,* perception qui se modifie & qui se subdivise en une infinité de sensations differentes" (pp. 169-70).

Boullier points out that with this we have the situation within which knowledge must be defined. The central difficulty is this: the clear and distinct ideas of understanding (especially that of extension) provide us with the schematic outline of natural knowledge, or a subject matter "en gros," as Boullier expresses it. Between the definition of the field of knowledge in the understanding, and the realm of nature whose universal structure is known, lies the infinitely variable content of awareness, spiritual states, qualitatively distinct, but with respect to knowledge unclear and confused. As representation and as spiritual, the sensation is not potential thought, but *thought.* With respect to knowledge, however, it is confused, and therefore not knowledge at all. Nevertheless, without sensation we can never fill in the schematic outlines of a science of nature; but with it the case seems hopeless. Finally, we must recognize that a fixed correspondence, if it exist, between sensation and the minute movements in the brain, is not guaranteed by the deliverances of sense itself.

Our escape depends on a twofold appeal to God's Providence. The irresistible impulse that leads us to attribute to the external world the sense qualities that are within the soul indicates the legitimacy of this appeal. God has seen fit to supplement the mechanical by the spiritual in order that the spiritual may make us aware of the mechanical. To know is part of God's plan for man. This guarantees that sense is genuinely a vehicle of and for knowledge. Since the essence of spirit

is thought, since sensation is within spirit, and finally since thought means above all clearness and distinctness, it follows that sensation *must* be somehow clear and distinct in its ultimate character, although not for our immediate experience. Sensation is a blurring of a sequence of elementary minute perceptions or ideas, that, as ideas, are clear and distinct and are in fact Lockean simples. If we could be aware of the minute ideas, if our intelligence were vast enough to comprehend each one as a separate state of the soul and as a logical entity, immediate experience and knowing would be identical. But if man's intelligence were so vast, man would not be man at all, and the divine purposes in creating humanity and the world would be unintelligible. "Enfin je croi qu'une Intelligence capable de faire l'analogie de la sensation générale que nous avons de notre corps, & de toutes les sensations qui s'exerce dans l'ame a son occasion; auroit une Science complette, non seulement de la structure du corps humain, jusques aux plus petits details, & jusques aux ressorts & aux mouvemens les plus imperceptibles, mais aussi de tous les raports du corps humain, avec les autres parties de l'Univers." But such a science is forever impossible for the human mind. We do possess, in terms of clear ideas, knowledge "en gros" of the world. But we are forever committed to the possession of the confusions of sensation corresponding to equal confusions of physiological events, and by extension our knowledge of things is doomed to confusion. "Cet esprit n'est pas capable de voir avec clarte ce qu'il aperçoit confusément en petit; il seroit accablé par une multitude d'idées disproportionnées à son étendue; cependant il jouit de ces mêmes idées sous la forme de perceptions confuses, de la maniere dont cela lui convient & dont il en peut jouir." This is due to the Providence of God. "Elles sont pour lui une source d'utilitez & de plaisirs: Et la sagesse de Dieu en tout si digne d'être admirée ne sauroit mieux mériter notre admiration que par cet endroit" (pp. 172-73).

APPENDIX B

GERDIL AS ILLUSTRATION OF A LATER STAGE IN THE CONTROVERSY

Gerdil's dissertation on the distinction between men and animals possesses interest because it illustrates the change of emphasis and background in the later stages of the controversy. The question for Gerdil is not the existence of an animal soul, but the demonstration of the human soul's existence. The problem is not defined primarily by the opposition of automatism and anti-automatism; rather, the controversy is defined now by full-blown materialism. Gerdil's opponent is the materialist. Animal automatism had been absorbed into materialism; mechanical explanation had become the instrument of scientific explanation. At an earlier period in the controversy no one had

seriously pushed the argument from animal automatism to the conclusion that men are machines. But in Gerdil's era materialistic metaphysics is a serious movement. The problem for Gerdil is to show that there exists a distinctive difference between man and the brute, so that, even if we grant automatism as an incident in the materialist's doctrine, nevertheless the human soul escapes the materialist's net. There is something more than matter in man.

The problem therefore is *not* to show that man differs from the animal *in degree*, but *in kind*. There exists a distinctive difference. The difference upon which Gerdil insists is precisely the difference which materialism denies or minimizes. The factor in question is the power of forming abstract ideas, and of attaching them to signs. This power is denied by the materialist—for he denies the very existence of the abstract and universal idea. Gerdil is obviously writing against de la Mettrie, whom he quotes. He says: "Les Matérialistes ont senti combien il étoit difficile, ou, pour mieux dire, impossible d'accorder leur système avec les idées abstraites ou universelles, dont l'empreinte ne peut se rapporter à l'impression d'aucun objet corporel. . . . Ils ont donc pris le parti de trancher le noeud de la difficulté. . . . Ils ont nié . . . qu'il y ait des idées universelles; ils ont prétendu y suppléer par les idées des signes, & réduire toutes les manières de connoître à l'imagination" (pp. 152-53). Gerdil must insist therefore that abstract ideas constitute an order essentially different from ideas of the sensible qualities of bodies. The animals, indeed, may possess the latter; and in this sense may be regarded as possessing an intelligence. But the intelligence that cannot know abstract ideas, and that is limited to distinguishing objects by sense impressions, is far lower than the soul endowed with the faculty of abstract truth (p. 109). The animal does not form combinations of ideas, such as are the fruits of reflection. The animal intelligence, accordingly, differs from the human not in degree but in kind. Nature in all creatures has joined to their faculties an inclination that leads them to use these faculties for their own conservation, increase, and propagation. Man, of course, falls under the scope of the principle; but in his case this inclination is related to a capacity for rational reflection.

Since the human intelligence differs from the animal in kind and not in degree, Gerdil directs his attention to the refutation of the argument based on degree. There exist within the realm of animal life insensible gradations of intelligence. But we cannot infer that human intelligence is merely the highest degree in the scale. However high in the scale an animal may be, the brute intelligence is subordinated to an instinct directing it upon sensible objects, and so there never result abstract ideas. Moreover, the argument based on degrees of bodily organization is equally invalid. We cannot argue that, since human bodily constitution is only better in degree than the animal's; that, since the more delicate and intricate the organization of animals, the greater the range of sensible objects and ideas from sense; therefore,

the human mind differs from the animal merely in a still greater range of sense activity corresponding to an even greater delicacy of organization. Gerdil, in refutation, insists that because men do possess abstract ideas, and these are different in order from ideas derived from sense, the real conclusion to be drawn from the argument is that the degree of bodily organization cannot explain human intelligence. Just because the human body differs only in degree from the animal bodies, therefore the bodily organization cannot explain the difference in kind which, in point of fact, distinguishes the human from the brute intelligence (pp. 115-20). Gerdil states the usual dilemma: either we must attribute to animals feeling and perceptions, and therefore a soul principle different from matter, however inferior to the human soul; or else we must regard their instinct as wholly dependent upon bodily organization, and then there is in the brute neither feeling, perception, nor thought. Gerdil states that he will refrain from estimating the relative merits of these two positions. It is evident, however, that Gerdil takes the distinction between the idea from sense and the abstract idea as critically important. From the standpoint of the abstract ideas, sense knowledge can scarcely be called knowledge at all. The argument that, as God has given perception and hence some degree of knowledge to animals, and so to the more perfect organization of man he has given a higher degree of knowledge, is invalid. Processes arising from sense and directed toward sensible objects—and animal "sagacity" is always so directed--can scarcely be called knowledge at all.

There are important subsidiary reasons why Gerdil insisted upon the critical importance of universal ideas as the distinctive difference between man and the animals. He recognizes that the materialist will argue as follows: the differences between man and the animals can be explained by differences of bodily organization plus the education process. The trained animal suggests that the differences are merely matters of degree. If this be granted, it follows that ideas of religion and morality are merely the fruits of education, and therefore have a purely conventional nature. They are "prejudices." To this Gerdil replies that the differences in the very training of man and the animals reveals a fundamental unlikeness in kind in their respective capacities. The man born deaf and dumb, later cured of his ailments, did not possess ideas of God, the soul, and morality. But education, urges Gerdil does not place in the mind such ideas; rather it *educes* them, and does so only because of the original endowment of a capacity for thought present in man alone (p. 125).

The materialists "sont forcés de rejetter les idées universelles, pour pouvoir tenir dans leur systême," but experience, "en nous assurant ces idées, nous force de rejetter leur systême" (p. 156).

THE RÔLE OF DESCARTES IN SEVENTEENTH-CENTURY ENGLAND

STERLING P. LAMPRECHT

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STERLING P. LAMPRECHT

If we judge by the books, whether of philosophy or medicine, brought from England, Holland and Germany, Cartesianism hath made very considerable progress in those parts. Scarce once in an age is printed any course of philosophy according to the method of the schools; and almost all the works of that nature, that at this time are publick in France, are physical tracts that suppose the principles of the new philosophy: such books as treat of an universal, of metaphysical degrees of *ens rationis,* create fears in the booksellers minds; they'll cumber themselves with no more of them, and endeavor to rid their hands of all that they have left. . . . There is no talk of the Thomists, the Scotists, and the Nominals, at least there is no distinction betwixt them; all are numbred in the same predicament, and on the same side which they call the old philosophy, to which is oppos'd the philosophy of Descartes, or the new philosophy.

So wrote Gabriel Daniel, a witty French priest and an acute observer of his time, in the same year in which appeared Locke's *Essay.*[1] So rapidly did Descartes' fame spread after his first book appeared in 1637, that within a generation after his death his name was one to conjure with

[1] *Un voiage du monde de Descartes,* Paris, 1690. The quotation is made from the English translation by Thomas Taylor, 1692, pp. 177-78. This work was one of the most successful *vulgarisations* of philosophy in the seventeenth century. Its repeated editions in both French and English testify to the interest of the reading public in the philosophical controversies it exploited. Though Daniel, as a Jesuit, naturally belonged to Descartes' opponents, he turned his irony on both the Cartesians and their opponents (like Voetius of Utrecht and the Peripatetics generally).

wherever in western Europe any vigorous intellectual ferment was to be found. Some of the statements in the quotation were of course intended to apply primarily to France; but, as the literature that came from English presses shows, they actually do apply almost as completely to England. It is true, as Sir Leslie Stephen said, that "in England, the philosophical impulse of Descartes made no distinguished disciples." But it is also true, though usually not noted, that Descartes deeply influenced every English thinker of consequence (and many of less importance) between 1640 and 1700. It may even be said that the more significant the thinker the more he felt the stimulus and recognized the power of Descartes' mind. Hence when Sir Leslie Stephen went on to say that John Norris "seems to be the only exception to the general indifference," he distorted both the proper meaning of his first phrase and the facts about seventeenth-century England.[2] Norris was the first English thinker to feel Malebranche's influence, but was the last rather than the first to be stirred by Descartes directly. And in any case—and this is what concerns us here—there was no "general indifference." Descartes had no English disciple (unless exception be made of Antoine LeGrand who lived for thirty years in Oxfordshire and London) in the sense of a sworn propagator of strict Cartesian orthodoxy. But he had countless English admirers and pupils who carried on intense controversy over his ideas, accepting some, rejecting others, and, above all, gradually modifying Descartes' own meaning. We cannot hope to get a just account of the course of English philosophy in the seventeenth century without realizing the eagerness with which Descartes was examined. We may hesitate to pronounce to what extent he merely reinforced tendencies already developing and to what extent he caused

[2] *English Thought in the Eighteenth Century*, 1876, I, 32.

these tendencies. But at least his ideas were a crucial ferment in the thought of the time. Gilbert Burnet (who as pupil of Tillotson, friend of Cudworth, and, later, critic of Locke, knew his period well) reflected contemporary judgment when he wrote that Descartes was "easily the chief of all the philosophers who have flourished up to the present time."[3]

At the outset of a discussion of Descartes' influence in England it is perhaps advisable to deal with the accepted tradition that, while Descartes originated the rationalistic movement on the Continent, Bacon was the controlling genius throughout the development of empiricism in England. This neat historical formula both minimizes the empirical element in Descartes and exaggerates the empirical element in England. Aside from Robert Boyle there is no important thinker in England in the seventeenth century whose primary allegiance was to Bacon rather than to Descartes. Edward Howard, himself a stupid mind and a foe of the whole of modern astronomy which he called "the Copernican, or Cartesian system,"[4] maintained in 1700 that the principles of Descartes were but "fictitious inventions" in comparison

[3] *Telluris theoria sacra,* 1681, p. 184. Failure to realize the rôle of Descartes in seventeenth-century England has been furthered by Bouillier who has been a kind of official authority on all phases of Cartesianism; cf. his inadequate chapter on England in his *Histoire de la philosophie cartésienne,* 1854. So the Encyclopaedia Britannica (11th ed., VIII, 89d), contained the statement that "in England Cartesianism took but slight hold." The best work yet written on English philosophy in the seventeenth century is Charles de Rémusat's *Histoire de la philosophie en Angleterre depuis Bacon jusqu'a Locke,* 2 vols., Paris, 1875. But his method of treating successive English thinkers in turn prevented him from assembling in one place the information he had on Descartes. Professor Marjorie Nicolson wrote an important article on "The early stage of Cartesianism in England," *Studies in philology,* Vol. XXVI, No. 3, pp. 356-74, to which, though it seems to me to exaggerate the importance of Henry More, I am greatly indebted.

[4] *Remarks on the New Philosophy of Descartes,* 1700, p. 209.

with the works of "our incomparable Bacon." But Howard not only lacked an understanding of the nature of modern science, but also protested as he did just because the whole century before him had been following the French instead of the British leader; and in his very irony that men were as foolish to praise French philosophy as superior to English as they were foppish to prefer French dress to English, we discover a reflection of Descartes' preëminence in the intellectual life of England.[5] It was Descartes rather than Bacon who symbolized a thorough acceptance of the results of natural science, as it was he rather than Bacon who, with his mathematical genius, understood and justified the method by which those results were obtained. It was Descartes rather than Bacon who made the conservative forces at the universities tremble for the past that seemed imperiled by the implications of the new views of the physical world, as it was he rather than Bacon who aroused the progressive forces to zealous support. Even in Bacon's nation it was Descartes who first made the intellectual classes aware of the issue between what came to be called "the old philosophy" and "the new philosophy." Both Bacon and Descartes taught that knowledge is power; both fostered the hope that men might through science triumph in mastery over the physical world. But to the seventeenth century Bacon seemed (and quite justly) to have done little actually to promote that mastery in comparison with the epoch-making discoveries of Descartes. Bacon was tied by his doctrine of forms more closely to scholasticism than was Descartes by any medieval ideas he retained. While Bacon was talking about prerogative instances, he was only stuffing hens with snow to observe the effects of cold; while Descartes was revolutionizing mathe-

[5] *Remarks on the New Philosophy of Descartes,* "Preface to the reader."

matics by applying algebra to geometry,[6] he was also formulating laws for the entire physical world. English pride could not blind English eyes to the superiority of the French thinker. An anonymous translator of Descartes into English gave his estimate of both Bacon and Descartes in his "Advertisement to the reader," under date of November 6, 1648. He wrote that Bacon "of all of them that have written before you [*i.e.*, Descartes], seems to me the man who had the best notions, concerning the method to be held to bring the physicks to their perfection." But he also insisted that "no man in the world but your selfe [*i.e.*, Descartes again], (at least whose writings we have) ever discovered the true principles, and understood the first causes of whatever is produced in nature."[7] We may of course discount such extravagant praise as coming from one who was seeking readers for his translation; and we may agree or disagree with his opinion of the intrinsic greatness of the two men. But any acquaintance with seventeenth-century literature in England will reveal that such was the relative rating given to Bacon and Descartes until about the year 1700.

The accepted tradition of our own day that makes Bacon the leader of English thought and Descartes of Continental thought has been due to two factors, Newton and Locke. Their works supplanted Descartes' as texts in the University of Cambridge in the 1690's; and thereafter the direct influence of Descartes in England came to a speedy end (at

[6] It may be, as some historians maintain, that the Englishman Harriot anticipated Descartes' mathematical feat; but it is still true that in the seventeenth century Descartes received the credit and the bulk of the praise.

[7] Quoted from the first English translation of Descartes' *The Passions of the Soule in Three Books*, 1650. It is interesting that the translator proceeded to beg for more works on "physicks" from Descartes, because no one else, he believed, could accomplish such wonders.

least until recent historical studies revived interest in it). But Newton and Locke did more than terminate the period of Descartes' predominance: they (quite unconsciously of course) produced in others a misunderstanding of his system. Newton's is the one name in seventeenth-century science that surpasses Descartes' in importance; and on points where Newton and Descartes differed, Newton came very generally to prevail. Hence after about the turn of the century in 1700 people ceased reading Descartes' scientific works, and associated his name merely with doctrines about innate ideas, ontological proofs, and deductions of matters of fact from *a priori* principles.[8] Then Locke, by absorbing a good deal of Cartesianism into his *Essay* and rejecting the rest, further identified Descartes with the abandoned doctrines. It was thus a truncated Descartes that was handed down to the eighteenth century, a Descartes that Hume finally demolished for English readers in the famous section of his *Treatise* on necessary connection.[9] Cartesianism became a synonym for a vicious rationalism that served only as the villain of the drama and the foil for the associationalism of the utilitarians and Mill's *Logic*.[10]

It may be hazardous for a historian to assert that the truncated Descartes of the eighteenth and the nineteenth centuries would never have startled the intellectual world of the seventeenth century into universal attention. But be that as it may, two things may safely be said. One is that the

[8] Descartes is still treated today in this partial way by most histories of philosophy, and even English translations of his writings omit those sections that contain his scientific writings. Thus most students of philosophy are not familiar with the very part of Descartes that most thrilled the seventeenth century and cannot recognize his influence when they deal with seventeenth-century English thinkers.

[9] Book I, Part III, Sec. 14.

[10] Locke cannot be called a Cartesian with quite the same degree of justice with which Aristotle can be called a Platonist. But the traditional opposition between Locke and Descartes is fully as misleading as the traditional antithesis between Aristotle and Plato.

metaphysical and epistemological ideas of Descartes came over into England as indissolubly part and parcel of the scientific world view he sponsored. The other is that for any proper understanding of English philosophy in the seventeenth century we must view Cartesianism in its context as the legitimate heir of Copernicus, Kepler, and Galileo against the peripatetic forces of decadent ecclesiasticism. The intellectual life of Europe was still a fairly homogeneous whole; the English reception of Descartes (at least in the years prior to Locke's *Essay*) differed slightly from the Dutch and the French. Descartes was read everywhere and was everywhere criticized along the same lines, favorable and unfavorable. Not until the 1690's did Cartesian ideas meet with markedly different treatment in England than on the Continent. Only then, under the contrasted leadership of Locke and Leibnitz, did English and continental thought come at last to pronounce incompatible judgments on Cartesianism. And though mutual influences continued, the unity of English and of continental intellectual life was thereafter impaired. But that is a later chapter in the history of ideas.

II

Descartes' connections with England began early and were both close and numerous. He was personally acquainted with a number of important Englishmen; his works circulated promptly in England; some of his works were translated into English soon after they first appeared; his principles, both in his own statement of them and in several compendiums by admiring followers, were adopted as texts in the English universities; he was discussed widely in the books and pamphlets of the period from 1640 to 1700. When these facts are so far as possible assembled, they constitute sufficient evidence for calling the middle of the seventeenth

century (or the years from 1640 to 1690) the Cartesian period in English philosophy.[11]

The chief center of contact between Descartes and Englishmen seems to have been the quarters that Mersenne occupied in his monastery in Paris. Mersenne obviously wished to make his quarters a rendezvous for travelers interested in intellectual affairs. He succeeded so well that Thomas Hobbes could say that Mersenne's "single cell might be prefer'd before an university."[12] During the years after the

[11] It is interesting to remember, though unimportant for the theme of this article, that Descartes is rumored to have himself made a trip to England in 1631. The evidence for this rumor is given in Baillet's *La Vie de Descartes* (1691, I, 229-30). The trip was made, if it really did take place, for the purpose of making observations of magnetic phenomena. Still more interesting and little known is the fact that Descartes once seriously considered the project of making England his permanent residence. The suggestion that he should do so came from Sir Charles Cavendish who, according to Baillet (II, 67), was "éperdûment amoureux de la philosophie de M. Descartes." The invitation was transmitted through Mersenne; and when Descartes indicated in reply that he would not wish to go unless his friend Mydorge the mathematician was included in the invitation, Sir Charles Cavendish resolutely offered to make handsome provision for Mydorge and his large family too! King Charles I was persuaded to interest himself in having such world-famous scientists as Descartes and Mydorge settle down in his domains, and promised some financial help in the experimental work that Descartes proposed to initiate in England. Unfortunately the King's money went, as Baillet says (II, 326), to the waging of war; and the turbulent condition of England led Descartes to abandon the project entirely. When Descartes first wrote to Mersenne concerning the invitation from Cavendish, he said: "Je vous diray entre nous que c'est un païs dont je préférerois la demeure à beaucoup d'autres." The consequences of such a move, had it occurred, might be the subject of an exciting philosophical romance!

[12] This phrase, as well as a longer passage that describes how Mersenne served as an intellectual link between important personages of his day, occurs in Hobbes's autobiographical verses (*Thomae Hobbesii Malmesburiensis vita*, 1679, p. 7):

> "Hoc fuit in minimis Mersennus tempore frater,
> Sed doctus, sapiens, egregieque bonus.
> Cuius cella scholis erat omnibus anteferenda
> Quotquot circuitus totius orbis habet. . . .
> Circa Mersennum convertebatur ut axem
> Unumquodque artis sidus in orbe suo."

arrest of King Charles I the number of Englishmen in Paris increased considerably; but even before the trouble broke out into open violence in England the visitors in Paris were frequent. The earliest English acquaintance of Descartes of whom we have record was Sir Kenelm Digby, who soon introduced his friend Thomas White.[13] Digby met Descartes at the Collège de Boncourt in 1644, and discussed with him the immortality of the soul. He had already known Descartes' writings and recognized his genius; he had written that Descartes "by his great and heroicke attempts, and by shewing mankind how to steer and husband their reason to best advantage, hath left us no excuse for being ignorant of any thing worth the knowing."[14] But in his conversations with Descartes he got little assistance on the theological points he wished to know about and showed almost no Cartesian influence in his subsequent writings, though Descartes' biographer called him "le défenseur des écrits & de la reputation de M. Descartes."[15] White also tried to make Descartes discuss such topics as predestination, free will, and grace, but naturally found the Frenchman too wily to commit himself on such points.[16] He had paid tribute to Descartes before this

[13] White was always referred to by Descartes as Vitus; he also went under the pseudonyms of Albius, Anglus, Candidus, and William Richworth. As Roman Catholics, Digby and White sometimes had difficulties in England; but Digby never had occasion to conceal his identity as did White.

[14] *Two treatises: in the One of Which, the Nature of Bodies; in the Other, the Nature of Mans Soul, is Looked into,* Paris, 1644. The quotation is from the English edition of 1658, p. 334.

[15] Baillet, *op. cit.*, II, 244.

[16] An amusing comment is made by Baillet *op. cit.* (II, 246), on Descartes' reluctance to discuss theological doctrines. "Je ne sçay si s'étoit par modestie ou autrement qu'il en ecrivit en ces termes à la Princesse Elizabeth. 'Pour ce qui est de l'état de l'ame après cette vie, dit-il, j'en ay bien moins de connoissance que Monsieur d'Igby. Car laissant à part ce que la foy nous en enseigne, je confesse que par la seule raison naturelle nous pouvons bien faire beaucoup de conjectures à notre avantage, & avoir de belles espérances: mais non point en avoir

time in extravagant language; for in addressing dialogues to a friend he had written as follows:[17]

O! cose, though he was a great man that said *Ars longa, vita brevis,* yet he must give me leave to be his interpreter, for 'tis not the length of art, but our not taking the right waie, which make's it long, otherwise art would be but a convenient solace to our lines. Would you thinke that a priuat man following the warres without helpe of others writings by his owne industrie should surpasse the greatest clarkes that have pored double his time upon bookes? and, this, our age hath shewed in a french gentleman, yet not only living but yong.

But White, like Digby, was disappointed that Descartes refused to be dragged into theological speculations and gradually wandered away from Cartesian to more ecclesiastically congenial circles.

Hobbes was perhaps the least sympathetic of all of Descartes' many English critics. He met Mersenne in 1636; and through him he was stimulated to study Descartes' writings and even to write objections for the *Meditations.* Possibly he knew Descartes personally; at least there is some evidence to indicate that he and Descartes and Gassendi dined together at the Paris abode of William Cavendish, the Duke of Newcastle.[18] But in any case Hobbes and Descartes had limited

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aucune assurance.' Cette reflexion de M. Descartes ne peut manquer d'être fort utile à ceux qui entreprendront de lire le gros livre de M. le Chevalier d'Igby touchant l'immortalité de l'ame.'' That Baillet near the end of the seventeenth century was still unaware of the skeptical or even naturalistic implications of Descartes' method is evidence of how seriously Descartes' treatment of God and *res cogitans* was taken by many of his contemporaries.

[17] *The Dialogues of William Richworth,* Paris, 1640, p. 551. White had a marginal note printed opposite this paragraph to tell his readers that he was referring to none other than ''Monsieur Descartes.''

[18] The evidence lies in a passage in John Aubrey's *Brief Lives,* edited by A. Clark, 1898, I, 366. The passage reads thus: ''I have heard Mr. Edmund Weller say that the lord marquisse of Newcastle was a great

approval of each other. Descartes praised Hobbes's *De cive* for its acuteness, though denying agreement with its wicked and dangerous principles; but he regarded Hobbes as obstinate and unable to reason clearly in physics and metaphysics.[19] Hobbes praised Descartes for his mathematical genius, stating that he might have been the world's greatest geometrician if he had confined himself to that study; but he added that Descartes' "head did not lye for philosophy," and (like many others) rather despised Descartes for insincerely assenting to the doctrine of transubstantiation.[20] Descartes finally broke off the personal relations by writing to Mersenne not to bother him further with any of Hobbes's writings or comments.[21]

The historian must thus decide that, had Descartes depended on personal friends, he would have received little hearing or understanding in England. Digby and White praised him and were unaffected by his ideas, and Hobbes (who could not secure a fair hearing even for himself) cared for little in Descartes except his mathematics and the idea of universal mechanism. Of course there were other English friends whom Descartes saw, such as the Duke of Newcastle and his brother Sir Charles Cavendish. Mersenne seems to have shared Descartes' ambition to found a "new school" to propagate his ideas and to have lost no opportunity to spread Cartesianism, through oral discussion or printed books. But it is safe to say that Descartes gained his Eng-

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patron to Dr. Gassendi, and M. Des Cartes, as well as Mr. Hobbes, and that he hath dined with them all three at the marquiss's table at Paris." This passage does not necessarily mean that he dined with the three at one and the same time, though Sir Leslie Stephen so interpreted it (cf. his *Hobbes*, 1904, p. 37).

[19] Baillet, *op. cit.*, II, 124, 174.

[20] Aubrey, *op. cit.*, I, 367.

[21] Baillet, *op. cit.*, II, 202.

lish audience through the importation of his writings rather than through his personal acquaintance.

The earliest known reference to the shipment of one of Descartes' writings into England occurs in a letter from Sir Kenelm Digby to Hobbes under date of October 4, 1637.[22] The letter reads as follows:

Sir

I come now with this to make good what I promised you in my last: which is to putt Monsieur des Cartes (whom Mydorge so much admireth) his book into your hands. I doubt not but you will say this is a production of a most vigorous and strong braine: and that if he were as accurate in his metaphysicall part as he is in his experience, he had carryed the palme from all men living: which nevertheless he peradventure hath done. I shall be very glad to heare your opinion of him: and so in hast I take my leave and rest,

Your true friend and servant,
Kenelm Digby.

Thus Descartes' *Discourse on Method* (for that alone of his books was yet published) was sent into England less than four months after it appeared from the press.[23] Mersenne sent the manuscript of the *Meditations* to Hobbes in time for him to make objections before the work was published in 1640. Sir Charles Cavendish carried a manuscript of the *Coniques* back into England with him in 1648.[24] Descartes himself, on August 14, 1649, sent a copy of his *Passions of the Soul* to the man who translated it into English and who explained that he had for some time eagerly awaited it as a

[22] Quoted from Professor Nicolson, *op. cit.*, p. 358. I have not seen the letter. Professor Nicolson gives as her source the *Rawlinson MSS D 1104*, f. 12, in the Bodleian Library.

[23] It came from the press on June 8, 1637, according to Baillet, *op. cit.*, I, 280.

[24] *Ibid.*, II, 326.

work that people would hasten to read.[25] Sir John Finch, in the winter immediately following Descartes' death, sent three copies of the *Principles of Philosophy* to his sister Anne (later Viscountess of Conway), one for herself and two for friends in Cambridge—and as he was pupil and friend of Henry More, we may guess that one of those friends was More.[26] Descartes' *Letters,* published posthumously by Clerselier, were reviewed in the *Philosophical Transactions* of the Royal Society as if the informed public already knew Descartes' ideas and would welcome further words from his pen.[27] The arrival of Descartes' books was not, to be sure, always prompt. Anne Conway complained of having to wait unduly long for the *Letters* to arrive;[28] and the reviewer of the *Letters* in the *Philosophical Transactions* said that "the curious would easily be induced" to read them "if copies of this book were to be obtained here in England, besides that one, which the publishers received from his Parisian correspondent."[29] None the less even complaints at delays in receiving books show that people knew Descartes enough to want more of his writings.

Furthermore, Descartes' works were put into English at surprisingly early dates (especially considering the ease with which educated Englishmen read French and the troubled conditions of their own country). The *Discourse on Method* was translated in 1649, the *Passions of the Soul* in 1650, the *Compendium of Music* in 1653, and various parts of his discussions of the principles of mechanics in 1661, 1665,

[25] *The Passions of the Soule in Three Books,* London, 1650. Cf. the "Advertisement to the reader by a friend of the author."
[26] Cf. a letter by Finch in Nicolson, *Conway Letters,* p. 65.
[27] Cf. I, 392-94; III, 810.
[28] In a letter dated Sept. 21, 1661, in Nicolson, *op. cit.,* p. 191.
[29] I, 393.

and 1697.[30] The *Six Metaphysical Meditations*, together with Hobbes's objections and Descartes's answers, seem to have first appeared in English in 1680 in a translation by William Molyneux. The life of Descartes by Peter Borellus appeared in English in 1670. Aside from these published translations we know that in 1650 Henry More translated the third book of the *Principles* for private use.[31]

The adoption of Descartes' writings as texts to be studied in the English universities is difficult to date precisely. Probably it occurred first at an early date at Cambridge.[32] James Golius, professor of mathematics and Arabic at Cambridge, corresponded with Descartes, so that some Cartesian ideas quite probably were filtering into the teaching at the university before the end of the 1640's.[33] Academic recognition was probably slow for any system of thought as radical as the Cartesian then was. At least in 1649 scholasticism was evidently still intrenched; for in that year John Hall of St.

[30] These translations are all to be found in the catalogue of the British Museum. I do not know whether the list is exhaustive. The discussions of the principles of mechanics are in *Mathematical Collections and Translations*, by Thomas Salusbury, 2 vols., 1661 and 1665; and in *The Use of the Geometrical Playing-Cards, as Also a Discourse of the Mechanick Powers*, 1697, which is in part a reprint of the material in vol. II of Salusbury. Salusbury reported that he found a manuscript of the mechanics of Descartes "amongst the many other rarities that enrich the well-chosen library of my learned and worthy friend Dr. Charles Scarburgh."

[31] Nicolson, *op. cit.*, p. 51. We cannot be sure of the purpose More had in making this translation. He sent it to his friend and pupil, Anne Conway, whom he always desired to please as much as possible. But he perhaps also used the manuscript in his teaching at Cambridge, as we know he later introduced Descartes' philosophy into his courses.

[32] J. B. Mullinger, in *The University of Cambridge*, 1873-1911 (III, 606), wrote that, according to Peile, Descartes was first made known at Cambridge by John Allsopp, one of the senior fellows at Christ's College. Allsopp is reported to have made the acquaintance of Descartes when traveling abroad "in the earlier years of the century." I have been unable to find out anything further about this John Allsopp.

[33] *Ibid.*, III, 93.

John's College, Cambridge, wrote a pamphlet on university reform in which he condemned the "jejune peripatetick philosophy" and praised the Cartesian philosophy as more suited to some "use in the affaires of life."[34] Even such protests, however, are significant. Certainly by the 1670's there was quite a bit of Cartesianism at Cambridge. Henry More's letters indicate that he was teaching the *Dioptricks, Meteors,* and the first three parts of the *Principles* in 1674.[35] And about the same time two compendiums of Cartesian doctrine were introduced as texts. One of these was Antoine LeGrand's *Institutio philosophiae secundum principia Renati Descartes . . . ad usum juventutis academicae.*[36] This book (which had appeared under a different title and in shorter version in 1671) reappeared in 1672, went through successive editions, and was translated in greatly enlarged form in 1694 as *The Entire Body of Descartes' Philosophy.* Though LeGrand included a long section on demons and angels (such as Digby and White had wanted Descartes himself to write!), he confined himself mostly to giving merely a summary of Cartesianism in formalized scholastic method such as he supposed was suited *ad usum juventutis academicae;* and the work is said to have been "much read in Cambridge."[37] The other compendium was Rohault's treatise on physics according to Cartesian principles. This first ap-

[34] *An Humble Motion to the Parliament of England concerning the Advancement of Learning and the Reformation of the Universities,* 1649, p. 26.

[35] Nicolson, *op. cit.,* pp. 393, 397.

[36] LeGrand was a Franciscan monk, educated at Douai and resident in Oxfordshire and London from about 1670 to his death in 1699. Bouillier made the error (*op. cit.,* II, 491) of saying that LeGrand was the one who introduced Cartesianism into England; and other historians like Erdmann have been misled by his authority. LeGrand reinforced Cartesianism after it was already getting to be well known, and really saw its decline after 1690.

[37] Anthony à Wood: *Athenae Oxonienses,* 1690, in the article on Samuel Parker.

peared in England in 1682 in Bonnet's Latin translation with LeGrand's comments; and later, in 1697, a more successful Latin translation was made by Samuel Clarke. But Rohault's treatise only held its ground after Newton's great popularity because Clarke's edition contained abundant footnotes in which Descartes' errors were corrected according to Newtonian principles!

At the other universities Descartes had a more difficult time in securing a hearing. Oxford was a stronghold of scholasticism. Glanvill and Locke who both took their degrees there in 1655 complained that their instruction in philosophy was arid and futile.[38] Yet Locke also testified that Descartes did much to arouse his mind during his student days.[39] And in 1654 Robert Baillie, professor of divinity and (later) principal of the University of Glasgow, wrote to Descartes' inveterate foe Voetius at Utrecht that the ideas of the heretic Descartes were intruding dangerously into English schools.[40] Thus during the Commonwealth Descartes was everywhere making headway; and after the Restoration the conservative reaction was less marked at English universities than elsewhere.[41] Probably what prevented such

[38] Glanvill later wrote to Henry More in such disparagement of Oxford in comparison with Cambridge that he offended that most zealous Oxonian Anthony à Wood. Wood revenged himself on Glanvill by writing his life up somewhat spitefully; cf. *Athenae Oxonienses.*

[39] Locke wrote that "the only philosophy then known at Oxford was the peripatetick, perplex'd with obscure terms and stuff'd with useless questions" (LeClerc's *The Life and Character of Mr. John Locke,* 1706, p. 2). But he also testified to Descartes' influence on him in early life, as his friend Lady Masham wrote to LeClerc after Locke's death. "The first books, as Mr. Locke himself has told me, which gave him a relish of philosophical things, were those of Descartes" (quoted from Henry Richard Fox Bourne's *Life of Locke,* 1876, I, 62).

[40] Mullinger, *op. cit.,* III, 496.

[41] Locke noted with amazement in his journal on March 22, 1676, during his travels in France, that "the new philosophy of Descartes" was "prohibited to be taught in universities, schools, and academies." Cf. Lord King's *The Life of John Locke,* 1829, p. 60.

proscriptions of Descartes' philosophy in England as occurred in both Holland and France in the latter part of the seventeenth century was the prestige of the Royal Society. This Society began with meetings of "gentlemen interested in natural philosophy" at Gresham College in London as early as 1645 or at Robert Boyle's lodgings in Oxford; it took definite form with its incorporation as the Royal Society under royal charter on July 15, 1662. Through its publications its work became generally known through the nation after 1665. And because the members of this Society recognized and publicly expressed their indebtedness to Descartes, Descartes' works could hardly be prohibited without attacking the Society itself.

In addition to the circulation and translation of the works of Descartes himself, a number of the most popular French works dealing with Cartesian ideas were put into English. Most important in this group were *The Art of Thinking* (or the Port-Royal Logic), 1685, by Arnauld and Nicole,[42] and the *Conversations with a Lady on the Plurality of Worlds,* 1688, by Fontenelle.[43] The former was of course a serious work and made a strong appeal to careful students of logic who were weary of the decadent scholastic discussions. The latter was a kind of *tour de force* and attracted the social *élite* with an amateur interest in intellectual affairs. Two adverse criticisms of Descartes were translated quite early—

[42] Nicole was another bond between Descartes and English philosophy. Locke made his acquaintance when in France in 1672, admired his *Essais de morale,* translated three of the essays (including one on Descartes' proofs for the existence of God), and presented his translations to the wife of his patron, the first Earl of Shaftesbury.

[43] The first English translation of Fontenelle's popular book was by Mrs. A. Behn (1688), the second by Glanvill (1695), the third by W. Gardiner (1715). More than a dozen editions in English appeared in one generation after its first publication.

an anonymous tract *Reflections upon Monsieur Des Martes's Discourse of a Method for the Well-Guiding of Reason, and the Discovery of Truth in the Sciences* (put in English by John Davies) in 1655,[44] and A.M.'s *A Discourse of Local Motion* in 1670. Also there were Des Fournelles' *A Discourse by a Learned Friar, Shewing that the Systeme of M. Des Cartes . . . Doth Contain Nothing Dangerous,* and Francois Bayle's *The General System of Cartesian Philosophy* in 1670, of which the latter probably would appeal to medical men on account of the renown of Francois Bayle as a physician. Gabriel Daniel's *A Voyage to the World of Cartesius* (from which a quotation was made above) appeared in 1692,[45] Baillet's *The Life of Descartes* in 1693, and Malebranche's *Search after Truth* in 1694. Thus all phases of Descartes' philosophy, both sides of Cartesian controversy, and both technical and popular treatments of Cartesian ideas were available in English before the end of the century.

This accumulation of evidence, no item of which is in itself important, shows quite conclusively that Descartes had a considerable audience in England in his own lifetime, that attention to his ideas was given by all classes of people who read books,[46] and that interest kept up through the century. How English thought was affected by Descartes' influence is a more important matter, however, and must be considered in the ensuing sections.

[44] In the copy in the British Museum some one has changed the printed date "1655" to "1654"; and the *Dictionary of National Biography* also gives the date as 1654.

[45] Baillet regarded this as the most important book on the life and thought of Descartes before his own. Cf. *op. cit.*, I, xviii.

[46] E.g., the first Lord Conway, who was not a systematic student, alluded to Descartes in a letter to his daughter-in-law Anne on July 1, 1651, in such a way as to indicate that Descartes, like Copernicus and Harvey whom he also mentioned, was a well-known figure. Cf. Nicolson, *op. cit.*, p. 30.

III

The rôle of Descartes in England was not uniform throughout the seventeenth century. Cartesian influence in that period must be analyzed into three fairly distinct phases which, though of course overlapping somewhat, succeeded one another at intervals of about twenty or thirty years. First there was a wave of eager embrace that started in the 1640's and continued through the 1650's and even into the 1660's. Secondly there was a serious effort to make critical appraisal of certain Cartesian ideas, an effort that began in the 1650's but was most insistent in the 1660's, 1670's, and 1680's. And finally there was the work of Locke in dealing with Descartes' philosophy, which, because of the immense prestige of his *Essay* after it appeared in 1690, was in its historical effect an almost authoritative judgment on the worth of Cartesianism. There was a burst of writing concerning Descartes in the last three or four years of the seventeenth century, and there was Norris's very Cartesian *An Essay towards the Theory of the Ideal or Intelligible World* (really an essay in defense of Malebranche's philosophy) in 1701 and 1704. But Locke was after the 1690's such a basis for subsequent speculations that his judgments on Cartesian method and conclusions were amazingly decisive for English thinkers. Shaftesbury, for example, made only two slighting references to Descartes in his *Characteristics;* and Hume used Descartes, as has been said, as merely a type of objectionable rationalist. Other eighteenth-century writers ordinarily made no such references at all. With Locke, therefore, the rôle of Descartes in England came to an end until fresh historical studies commenced at a much later date.

Each of these three phases of Descartes' influence in England deserves separate consideration.

Descartes was the only European figure who at the middle of the seventeenth century had sufficient prestige to provide a rallying point for the "new philosophy" against the "old philosophy." Thus he was idolized as a champion of progress, a kind of gallant knight who was fighting the battle of enlightened thinking against the forces of obscurantism. Two passages will illustrate the extent of the adulation which was poured upon Descartes at the outset. One is from Henry More's first letter to Descartes under date of December 15, 1648.[47]

By what intense pleasure my mind is filled, most distinguished sir, in reading your writings, no one can better conjecture than yourself. . . . I shall freely speak what I really think, namely that all the masters of the secrets of nature who have ever existed or now exist seem, in comparison with you, mere dwarfs or pygmies. . . . All the ideas in your *Principles of Philosophy, Dioptrics,* and *Meteors* are so coordinated and so consonant with each other and with nature, that the human mind and reason could hardly hope for a more agreeable and joyful sight.

The other passage is from the introduction that the anonymous translator wrote to the first of Descartes' works to appear in English, in 1649.[48]

The great Des Cartes (who may justly challenge the first place amongst the philosophers of this age) is the author of this discourse. . . . You may therein observe the lines of a well form'd minde, the hightnings of truth, the sweetnings and shadowings of probabilities, the falls and depths of falshood; all which serve to perfect this masterpiece.

Glanvill's first book is a further and effective proof of the way in which men were turning hopefully to Descartes' lead-

[47] Translated from More's Latin as printed in *A Collection of Several Philosophical Writings,* 1662, p. 61.

[48] *A Discourse of a Method for the Well-Guiding of Reason, and the Discovery of Truth in the Sciences.*

ership. The full title of the book is significant; it is *The Vanity of Dogmatizing; or Confidence in Opinions Manifested in a Discourse of the Shortness and Uncertainty of Our Knowledge, and Its Causes; with Some Reflections on Peripateticism; and an Apology for Philosophy* (1661). Glanvill consistently presented his readers with a choice between two alternatives—peripateticism and the kind of philosophy for which he would offer "an apology." He spoke of the choice as lying between the "steril, unsatisfying verbosities" of the peripatetics and the method of "the grand secretary of nature, the miraculous Descartes."[49] On the one hand are traditionalists who neglect mathematics and busy themselves with vague speculations about occult qualities and a *materia prima* that has no qualities we can conceive. "Aristotle's philosophy has been entertain'd by the most"; but it "is inept for new discoveries and therefore of no accommodation to the use of life." "Its intrinsick worth hath been concluded from the grandeur of its retinue," though "the wisest have always stood contradictory to that ground of belief."[50] On the other hand is Descartes with his discoveries that are fecund in practice and fitted for "the use of life." Indeed Glanvill went so far as to assert that "had heaven afforded that miracle of men, the illustrious Des-Cartes a longer day on earth, we might have expected the utmost of what ingenuity could perform."[51] And he brought his book to an end with an eloquent panegyric:[52]

What I have said here in this short apology for philosophy, is not so strictly verifiable of any that I know, as the Cartesian. The entertainment of which among truly ingenuous unpossest spirits, renders an after-commendation superflu-

[49] Pages 152, 211.
[50] Pages 148-78.
[51] Page 48.
[52] Page 250.

ous and impertinent. It would require a wit like its authors, to do it right in an enconium. The strict rationality of the hypothesis in the main, and the critical coherence of its parts, I doubt not but will bear it down to posterity with a glory, that shall know no term, but the universal ruines. Neither can the pedantry, or prejudice of the present age, any more obstruct its motion in that supreme sphear, wherein its desert has plac'd it; then can the howling wolves pluck Cynthia from her orb; who regardless of their noise, securely glides through the undisturbed aether. Censure here will disparage itself, not it. He that accuseth the sun of darkness, shames his own blind eyes; not its light. The barking of Cynicks at that hero's chariot-wheels, will not sully the glory of his triumphs. But I shall supersede this endless attempt: sunbeams best commend themselves.

Perhaps it is advisable at this point to remark that the condemnation of the peripatetics did not also involve, at least among the more thinking people, an utter condemnation of Aristotle. Just as the *Port-Royal Logic* in 1662 confessed that "there is not any author from whom we have borrowed more than from Aristotle in this logic, as one to whom the body of the precepts belong,"[53] so other Cartesian writers voiced some appreciation of Aristotle's merits. Perhaps we may regard the following unsigned paragraph in the *Philosophical Transactions* of the Royal Society as the kind of responsible and thoughtful estimate that the "new philosophy" held of Aristotle himself.[54]

We say, his *Logicks* and *Rhetoricks* are very valuable. His *Ethicks* and *Politicks*, for the most part, sound. His *Metaphysicks* in many notions acute. But all these are generally overwhelmed and degraded by the swarms of insectile systemes and dilute commentaries. And we reject his doctrine of a matter, which is *neque quid, neque quantum, neque*

[53] Quoted from the first English translation of 1685, p. 35.

[54] Vol. II, No. 23, pp. 412-13, under date of March 11, 1666 (1667 in our present reckoning).

quale, a formal and substantial ἐντελέχεια (a word too hard for Cicero to translate) and privation, a principle as good as the rest; his definitions of causes and affections; his quarternion of grosse elements and grosser mixtures, and insipid compositions and qualities, lesse significant than the popular air: all of them much fitter to beget eternal controversies, than to administer any satisfaction to a reasonable understanding. . . . We say heartily, read Aristotle, read him in his own stile; read him entirely and fully; not feeding onely on his ulcers and excrescencies; . . . and then hasten to our Christian philosophers, and they will forth-with acquaint you with the true works and wonderful contrivances of the Supreme Author, and with the discoveries, which by his indulgent providence and his benigne inspirations have been in former and later ages afforded, for the benefit, and the sincerely grateful acknowledgements of human race.

That is, to borrow again a phrase from Glanvill, "a schoolman is the ghost of the Stagirite."[55] And it was the typical schoolman who seemed to most thinkers in England so weak an alternative to Descartes. Though members of the Royal Society and other experimental minds did not hesitate to criticize adversely many of the opinions of Descartes on particular technical points,[56] they approved his method of abandoning "the philosophy of discourse and disputations" in favor of a direct investigation of the "geometry and mechanism" of nature.[57] Simon Patrick (formerly a student at

[55] *Op. cit.,* p. 152.

[56] E.g. the attacks on Descartes' denial of a vacuum by John Wallis, the mathematician (*A Discourse of Gravity and Gravitation, Grounded on Experimental Observations Presented to the Royal Society, November 12, 1674,* 1675) and by Robert Boyle, the physicist (*A Free Enquiry into the Vulgarly Receiv'd Notion of Nature,* 1686). Cf. also an English translation of a French attack on Descartes by A.M.: *A Discourse of Local Motion; Undertaking to Demonstrate the Laws of Motion, and Withall to Prove, that of the Seven Rules Delivered by M. Des-Cartes on This Subject, He Hath Mistaken Six,* 1670.

[57] Cf. an article in the *Philosophical Transactions* of the Royal Society, Vol. I, No. 2, pp. 27-28, under date of April 3, 1665.

Cambridge and later Bishop of Ely, but best known for his pastorate of thirty years at St. Paul's in Covent Garden) summed up the case for Cartesianism in an effective pamphlet that he wrote to vindicate the "new philosophy" in the eyes of the less enlightened clergy of the Anglican communion.[58] The peripatetic, he said, is like a mechanic who would try to repair a clock by discoursing on substantial forms and quintessence, whereas Descartes observed the laws of "that vast machine, the universe" and so knew how to handle any object in it.

Among the early champions of Descartes in England there were many who wished, like Patrick, to show that religion and the "new philosophy" had nothing to fear from each other. Liberals in the Church and experimenters in natural science both realized the harm that would come to their causes if antagonism developed between them. And Descartes' philosophy not merely lent itself but was seemingly designed to aid in this *rapprochement*. On the one hand the scientists were wont to insist that their discoveries were in full accord with teachings of Scripture and Christian theology. As late as 1671, after nearly ten years of notable achievement under such reputable leaders as Wallis and Boyle, the Royal Society still felt it advisable to mollify the religious scruples of their suspicious critics. And in the introductory remarks prefaced to Volume VI of its *Philosophical Transactions* assurance was given that

> the new philosophy . . . is so old as to have been the discipline in paradise; and from the first of mankind (who from observing the kinds and differences of animals gave them

[58] *A Brief Account of the New Sect of Latitude-Men, Together with Some Reflections upon the New Philosophy*, 1662, pp. 17-19. Patrick here anticipated by twenty-five years a delightfully humorous passage in Fontenelle's *Plurality of Worlds*, English trans. of 1688, pp. 10-12.

their names) to have been practiced and countenanced by the best of men; patriarchs and prophets; oft times with divine assistances and inspirations;; giving them, that were successful therein, very eminent attributes of glory, as in Noah, Moses, Solomon, Daniel, and others.[59]

On the other hand the liberal Churchmen desired ardently to keep people from supposing that the Church was hostile to science. Simon Patrick explicitly represented Cartesianism as the golden mean between superstition and atheism. He wrote:

> True philosophy can never hurt sound divinity. Christian religion was never bred up in the peripatetick school, . . . nor is there any cause to doubt but the mechanical also will be faithful to her, no less against the open violence of atheisme, than the secret treachery of enthusiasm and superstition.[60]

Cudworth reiterated the point that Descartes had revived the Mosaical type of atomism, not the Democritean atomism which Hobbes had dared to revive, and took pains always to contrast theistic and atheistic atomism.[61] Henry More (with his irrepressible fondness for the mysterious and the occult) went further and maintained that Cartesianism was in full accord with the Mosaical accounts of nature and the traditions of the cabbala. He pictured Descartes and himself as coworkers "dedicating our joynt labours to the use ond glory of the Christian church, laying at their feet the most true, as we conceive, and the most approvable philosophical interpretation of the first three chapters of Genesis as ever was

[59] Vol. VI, No. 69, p. 2088, under date of March 25, 1671.
[60] *Op. cit.*, p. 24.
[61] *The True Intellectual System of the Universe*, 1678, p. 174; *A Treatise concerning Eternal and Immutable Morality*, 1731 (though of course written much earlier), pp. 301-2.

yet offered to the world since the loss of the ancient Jewish cabbala."[62]

More's curious controversy with Thomas Vaughan, though not important in itself, is interesting as a phase of the effort to keep the Church from aligning itself against Cartesianism. Vaughan was, like More, a Platonist of the Plotinian type, given to mystic convictions; he wrote a number of works in 1650 in defense of a kind of cabbalistic mysticism.[63] More was anxious lest Vaughan create the impression that mystical Platonism was a foe of experimental science; and he wished to spread abroad what he called an "interweaving of Platonisme and Cartesianisme."[64] So he recommended to Vaughan a reading of Descartes as a corrective of his scientifically antiquated ideas;[65] and when Vaughan replied to this public upbraiding that Descartes was "a whim, and a wham, . . . a fellow that invented ridiculous principles of his own,"[66] More confessed openly that Platonists must beware of appearing ridiculous to "modern" eyes. He went on to assert that Descartes is "the wisest naturalist that ever came to my hands" and his philosophy " a most rationall,

[62] Quoted from the "Preface general" of *A Collection of Several Philosophical Writings*, 1662, p. xii. Cf. also *An Appendix to the Defense of the Philosophick Cabbala*, Chap. I, Sec. 8-9, and the letter to V.C. in the same volume. More ventured to remind his readers that Descartes had said practically the same thing concerning the relation of his own theories to Scripture.

[63] *Anthroposophia Theomagica, Anima Magica Abscondita*, and *Magica Adamica*. Vaughan here maintained that men could by mystical insight "discover those universal invisible essences" in the mind of God, and could therefrom penetrate "all the secrets and mysteries in nature more easily than by following the scientists, ancient or modern (p. 28).

[64] *Op. cit.*, "Preface general," p. vi.

[65] *Observations upon Anthroposophia Theomagica, and Anima Magica Abscondita*, 1650, pp. 88-89.

[66] *The Man-Mouse Taken in a Trap*, 1650, p. 114.

coherent, subtill peice, and an hypothesis accurately and continuedly agreeing with the phenomena of nature.''[67] More was interested in physical science for its own sake and had some competence in it, though he increasingly grew afraid of its naturalistic implications as he grew older. But at least in this controversy his chief concern was for the good standing of the Church in the eyes of men who were pledged to the ''new philosophy.''[68]

In this preliminary period, then, the philosophy of Descartes was eagerly embraced in England by those who were weary of peripatetic subtleties and hopeful of new knowledge from experimental inquiry. And it could be so embraced because, at first glance at any rate, it seemed a friend to religion. It seemed to promise mastery of nature without imperiling the ''liberal'' or latitudinarian brand of theology. In *An Address to the Royal Society,* Glanvill maintained that the ''mechanick philosophy yields no security to irreligion.'' He identified Cartesianism and atomism and mechanism. But he assured his readers that ''the mechanical hypothesis'' is not the same as ''mechanism upon Hobbian conditions,'' but is rather a means of securing ''the foundations of religion against all attempts of mechanical atheism.''[69] Yet the very assurance that experimental science was not dangerous to religion meant that inquiry was beginning on points that required deeper analysis than men like Glanvill were capable of giving. Cartesianism was about to become the matter for technical and profound investigation. A period of controversy ensued.

[67] *The Second Wash of Alazonomastix,* 1651, p. 41.

[68] To More's second rebuke Vaughan replied in a tract called *The Second Wash: or the Moore Scour'd Once More,* 1651. And with that the controversy ended.

[69] Prefixed to his *Scepsis scientifica,* 1665.

IV

The transition from eager (and rather uncritical) acceptance of Descartes to searching and critical appraisal of a number of the ideas he had advanced came toward the end of the Commonwealth and in the early years of the Restoration in England. It may be seen in a dramatic form in the change that occurred in the mind of Henry More. More, though a charming figure and an influential teacher, was not a penetrating thinker; he did not quickly realize the implications of ideas he took up with almost feverish ardor. In 1659 he wished to "encourage the reading of Descartes in all publick schools or universities," in order that "students of philosophy may be thoroughly exercised in the just extent of the mechanical powers of matter, how farre they will reach, and where they fall short; which will be the best assistance to religion that reason and knowledge of nature can afford."[70] And in 1662 he was annoyed by hostile criticisms of Descartes and expressed the wish "to clear Cartesius from that giddy and groundless suspicion of atheism."[71] But in 1668 he criticized his own early attitude by making a distinction between the physics and the metaphysics of Descartes. The former he still accepted because it seemed consonant with "the ancient cabbala of Moses"; but he rejected the latter in strong terms. "The rest of his philosophy is rather pretty than great, and in that sense that he drives at, of pure mechanism, enormously and ridiculously false."[72] And finally in 1671 he spoke of "the abominable

[70] *The Immortality of the Soul*, "Preface," Sec. 15.
[71] *A Collection of Several Philosophical writings*, "Preface general," p. xi.
[72] *Divine Dialogues: the First Three Dialogues*. The passage quoted is from "The publisher to the reader" which More amusingly put forth as if from another writer, in order to condemn himself for having formerly "overshot" himself in praising Descartes.

ideas of Cartesius, Hobbius, and other such mechanical philosophers which I impugn and refute as most impious, most inept, and entirely false.''[73] He still embraced the experimental method for natural science; but he now appealed to the Royal Society which was well established and in general esteem, and had no use any longer for Descartes.[74]

The change in More's thinking is probably to be connected with warnings given to him by John Worthington, first in conversation and then in a letter on November 29, 1667. More was doubtless susceptible to the currents of opinion which were generally becoming more critical toward Descartes. But it is striking that his first public condemnation of Descartes appeared in the year after Worthington's warnings, and in a foreword to a work which otherwise does not much indicate the coming change. Worthington wrote as follows:[75]

You have as highly commended Des Cartes, as is possible, and as knowing no better method of philosophy, you recommend it effectually in some parts of your books, whereby you had so fired some to the study of it, that your letter to V.C. (which came long after) could not coole them, nor doth it yet; but they are enravisht with it, and derive from thence notions of ill consequence to religion, you being sensible of this great evil, as also of the uncertainty of his philosophy throughout (as you intimated to me) you cannot but think, how much it concerns you to remedy this evil. And seeing

[73] Translated from *Enchiridion metaphysicum,* ''Ad lectorem praefatio,'' Sec. 10.

[74] Professor Nicolson, *op. cit.,* p. 364, quotes a remark from the unpublished second part of Ward's *Life of More (Christ's College MSS, Dd. 7. 12,* f. 142). The remark by Ward is that ''Des Cartes his metaphysicks I could never perceive that he much admired.'' Yet though the remark is true, it is also true that More did not perceive any impiety in Descartes' metaphysics until after 1667.

[75] Quoted from ''The Diary and Correspondence of Dr. John Worthington,'' in *Remains Historical and Literary . . . Published by The Chetham Society,* 1886, CXIV, 253-56.

they will never return to the old philosophy, in fashion when we were young scholars, there will be no way to take them of from idolizing the French philosophy, and hurting themselves and others by some principles there, but by putting into their hands another body of natural philosophy, which is like to be the most effectual antidote. And to do this will be more easy to you than any.

Worthington was overestimating his friend's powers as well as exaggerating the danger of the earlier Cartesian adulations. But the letter indicates how ripe the time was for careful criticism of Descartes' ideas.

Fortunately other English philosophical minds had a greater balance than that of More; and as they did not embrace him at the outset so ecstatically, they did not recoil against him so violently in the end. Their criticisms did, however, examine into Cartesianism at many important points, and sought to weigh the merits of many Cartesian principles. They were often quite sane and thorough, though they did not always grasp correctly what Descartes had meant. And usually these criticisms presented philosophical alternatives which remained open issues until Locke's *Essay*, with its enormous vogue and persuasive simplicity and common sense, defined a position into which a certain part of Cartesianism was incorporated and from which a certain part was excluded. Locke's decisions, whether philosophically correct or not, did for a long time overshadow all other philosophies in England. And after his time Cartesianism was hardly more than a target against which Englishmen might direct their shots. We shall now proceed to examine a number of matters on which Descartes stirred up controversial discussion in England before Locke's work appeared.

1. One point in Descartes' philosophy about which criticism began to arise was the method of doubt. English thinkers generally approved a kind of doubt, but they came gradu-

ally to realize how different their doubting was from Descartes'. In Descartes' writings the method of doubt was preliminary, histrionic, and unsparing. That is, he began with it, in order eventually to enunciate new doctrines of demonstrated certainty; he used it as a rhetorical means of carrying his readers to conclusions he foresaw; and he extended it to every phase of method, including the trustworthiness of the senses and the reason of men. In England it was none of these things. The English commended doubt as a wholesome caution with which to assert conclusions that could not really be demonstrated; they regarded this caution as a kind of moral quality of mind; and they usually were unwilling to be so rigorous in applying doubt to the views of common sense. Descartes used the method of doubt to upset all other philosophies than his own; the English used it as an argument for mutual toleration of conflicting opinions on speculative points. For Descartes it was a technical device to be exploited for all it was worth; for the English it was a cultural and social responsibility.

Joseph Glanvill was perhaps the Englishman who most explicitly welcomed Descartes' method of doubt though he was far from understanding its original import. He never tired of reiterating his views on "the vanity of dogmatizing." "Confidence in uncertainties," as he put it, "is the greatest enemy to what is certain."[76] But his wide difference from Descartes is seen when he went on to say that "the knowledge I teach, is ignorance."[77] Systematic skepticism, he acknowledged, would be worse than dogmatizing; but dogmatizing is, he thought, more prevalent and hence more in need of attack. "I am apt to think, that mankind is like to reap more advantage from the ignorance of Des Cartes, than

[76] *Vanity of Dogmatizing*, "Epistle dedicatory."
[77] *Ibid.*, "The preface."

perhaps from the greatest part of the science that was before him."[78] Or again: "I think the method of the most excellent Des-Cartes not unworthy its author; and . . . a scepticism, that's the only way to science."[79] In thus judging of Descartes, Glanvill was under the impression (which was quite incorrect) that Descartes "intends his principles but for hypotheses, and never pretends that things are really or necessarily, as he hath supposed them."[80] And when he undertook to write a continuation of Bacon's *New Atlantis,* he pictured the inhabitants of that fair island as converts to Cartesianism who therefore agreed on a few, plain truths and differed peacefully on a host of unverifiable matters. He even made the comment that Cartesian doubt was a kind of cure for enthusiasm.[81] He thus consistently reinterpreted (or misinterpreted) the Cartesian doctrine he professed.

Most English critics of Descartes were unwilling to accept his method of doubt, even as far as Glanvill, because they saw more clearly what it really involved. For example, in 1665 John Davies accused Descartes of being too precipitate in doubting everything just because he discovered some accepted beliefs which were without foundation.[82] Especially did he condemn Descartes for excessive disparagement of the senses. "The testimony of the senses is the true and natural foundation of all philosophy," both because it is the source of memory and generalization, and because it alone

[78] *Scepsis scientifica,* 1665, in the "Letter to Tho. Albius," p. 5.
[79] *Vanity of dogmatizing,* 1661, pp. 73-74.
[80] *Ibid.,* p. 211. Cf. also the "Letter to Tho. Albius," p. 72.
[81] *Essays on Several Important Subjects in Philosophy and Religion,* 1676, Essay VII, especially pp. 5, 50-54.
[82] *Reflections upon Monsieur Des Cartes's Discourse of a Method for the Well-Guiding of Reason, and Discovery of Truth in the Sciences,* p. 15. These *Reflections,* though translated rather than written by Davies, are treated in this paper as representing the views that Davies himself held.

(even in Descartes' own practice!) serves to check up our guesses. The senses, he maintained, correct their own defects in most cases; they do not deceive us at all when the organ of sense is well disposed, the objects well presented, and the intervening space in the requisite condition.[83] Thomas Sprat, Bishop of Rochester, in his very influential *History of the Royal Society of London,* 1667, continued the same criticism. He charged Descartes with being premature and excessive in giving "himself over to a reflexion on the naked ideas of his own mind." Such capricious action, he added, may be "more allowable in matters of contemplation, and in a gentleman, whose chief aim was his own delight"; but the method is not suited to the practical, solid, and far-reaching inquiries of the Royal Society.[84] This point was repeatedly stressed throughout the century. It may well have been one of the grounds for a growing realization of the distinction between the empiricism of English thought and the rationalism of the continent. Toward the end of the century John Sergeant, in complete antithesis to Glanvill's earlier attitude, maintained that Cartesian doubt was both a cause and an instance of enthusiasm. He even tried to exploit in this connection the story of Descartes' vision and vow of November 10, 1619. He wrote:[85]

When Cartesius was laying his *Method to science,* by denying his senses, and divesting himself of all his former knowledge, which was no less than to unman himself, he fell, for some few days, into a spice of enthusiasm; nay, was brim-full of it; and fancy'd he had visions and revelations,

[83] *Ibid.,* pp. 41-47.

[84] Page 96.

[85] *Non ultra: or, a Letter to a Learned Cartesian,* 1698, p. 108. Cf. *Solid Philosophy Asserted,* 1697, "Preface to the reader." Sergeant was aware that Descartes's attack on the validity of the senses was but an adroit way of introducing his epistemological dualism; and, disliking that dualism, he hastened to attack one of its justifications.

so that he seem'd crack-brain'd, or to have drunk a cup too much.

And if this tone is not only a bit vituperative but also too flippant, another passage by another writer at about the same date can be taken as more representative of English opinion. This writer, Thomas Baker, though but a dilettante, pleased many readers with his graceful *Reflections upon Learning, Wherein is Shewn the Insufficiency Thereof, in Its Several Particulars,* 1699. He wrote (in harmony with much in Locke):[86]

Let us consider this new method of knowledge by doubting, upon which our modern metaphysicks turn so much, and of which our new philosophers talk so loudly: for my part I see no great use either of their doubting, or of the knowledge, it leads to. For what is it we must doubt of? Even of the most certains truths in nature, of the verity of our own bodies, as whether we have hands, arms, and legs. And what is the first knowledge that results from this doubting? That since I doubt, I am; for that which doubts must it self necessarily have a being. Now allowing all this, I do not think we are much the wiser; for had ever any man real doubts of these matters? Or did ever any man in his wits question the truth of his own being? Such doubts and such proofs are only fitted for melancholy persons, and I hope we are not philosophizing at this time of day to yield conviction to such men.

English opposition to Descartes' doubt of the ability of the mind to make necessary judgments concerning the implications of ideas (as in mathematics) was practically unanimous. Prior to Locke, the English thinkers were almost all quite prone to insist on necessary truths. Culverwel enunci-

[86] Page 101. Marginal notations are made beside this passage to references in both the *Principles* and the *Meditations* of Descartes. A passage of similar import is in Edward Howard's *Remarks on the New Philosophy of Descartes,* 1700, pp. 4-9.

ated a position common to all the Cambridge Platonists when he wrote:[87]

> The certainty of sense is more grosse and palpable, the certainty of intellectuals, 'tis more cleere and crystalline. . . . Sense 'tis but the gate of certainty, . . . the understanding 'tis the throne of it.

In agreement with this Platonism others went on to object to two further points which were closely involved with Descartes' doubt of the powers of reason. One of these was his attempt to overcome this doubt by proving the existence of God, who would not endow us with deceptive faculties; the other was his tendency to regard truth as created by divine will. The former is, it was frequently pointed out, a clear case of circular arguing. Even Glanvill could not stomach this aspect of Cartesian doubt.[88]

> Descartes is out in his method; when from the idea's he endeavors to prove that God is, and from his existence that our faculties are true: when as the truth of our faculties was presupposed to the proof of God's existence; yea, and to that of our own also. So that, that great man seems to argue in a circle.

There was, Cudworth granted, "a plausibility of piety in this doctrine"; but "truth is not factitious," and "no power how great soever, and therefore not omnipotence itself, can make any thing to be indifferently either true or false."[89] The animus behind the unanimous resistance to Descartes

[87] *An Elegant and Learned Discourse of the Light of Nature,* 1652, p. 153.

[88] *Essays on Several Important Subjects in Philosophy and Religion,* 1676, Essay II, p. 48.

[89] *The True Intellectual System of the Universe,* pp. 717-18; and cf. his *Treatise of Freewill,* edited by John Allen, 1838, pp. 49-50. The same point was expressed by Bishop Parker, *Disputationes de deo et providentia divina,* 1678, p. 490; and Thomas Baker's *Reflections upon Learning,* 1700, p. 58. Cf. also Daniel, *op. cit.,* p. 82.

at this point was the fear of imperiling what Cudworth called "eternal and immutable morality." George Rust wrote that in the denial of eternal truths prior to any will, human or divine, lie all "rantism, debauchery, and all dissoluteness of life."[90] And Glanvill, when he incorporated Rust's essay into one of his own volumes and wrote a preface to it, said that to make truth depend on the will of God leads to "the blackest and most blasphemous opinions."[91] Even though Cudworth's *Eternal and Immutable Morality* did not appear until far into the next century (1731), his views seem to have been generally adopted by the men who were associated with the Cambridge school.[92]

2. If the Cambridge Platonists objected to Descartes' initial distrust of reason, they approved his appeal to innate ideas. They can hardly be said to have derived their doctrine of innate ideas from him; for the doctrine goes back to Lord Herbert of Cherbury and others. They cannot even be said to have seen what Descartes meant by innate ideas; for he meant (at least usually, though his position is not unambiguous) ideas that cannot be denied without contradiction, and they meant (at least many of them) ideas that were in some way inborn. The historian can hardly acquit either Descartes or the Cambridge Platonists of either considerable obscurity or frequent inconsistency in their treatment of innate ideas. But on the whole innateness was more a logical matter for Descartes, and more a psychological matter for them. John Smith talked of *notiones ortae*. Culverwel (who of all the Cambridge school was perhaps most empirically

[90] *A Discourse of Truth*, 1682, included in Glanvill's *Lux orientalis*, p. 181.

[91] *Ibid.*, p. 156. One cannot help but smile at Glanvill's naïve logic in saying that if good were merely what God willed, then God could do the most terrible and wicked things!

[92] Cf. Theophilus Gale's *Philosophia generalis*, 1676, *disser. procm.*

minded) said that "there are stampt and printed upon the being of man . . . some first and alphabetical notions."[93] And Glanvill followed the Cambridge group in saying that we have certain "fundamental notices, that God hath implanted in our souls; such as arise not from external objects, nor particular humours or imaginations, but are immediately lodged in our minds; independent upon other principles or deductions; commanding a sudden assent; and acknowledged by all sober mankind."[94] Indeed it was the widespread tendency of English thinkers throughout the seventeenth century to appeal to innate ideas (rather than Descartes' more cautious statements of the matter), that aroused Locke to devote the first book of his *Essay* to the subject. Yet Descartes' example probably spurred them on in their appeal to innate ideas.

3. A Cartesian principle that played a leading rôle in English thought was the dualism that contrasted ideas (or sensations) in the mind with physical objects outside the mind. Descartes did not of course originate this epistemological doctrine, nor did his works first introduce it into England. It was the commonly accepted implication of the current scientific methodology. But Descartes' influence can be said to have strengthened the vogue of the doctrine and to have given it authority and prestige. Sir Kenelm Digby, peripatetic as he was and remained in spite of his associations with Descartes, espoused this doctrine in part. He accepted the theory that bodies without us do so give "blows" upon our external organs as to set up interior motions that, when continued to the brain, "work sensation in us."[95] Glanvill also followed Descartes in part, hesitating to assent to the

[93] *Op. cit.*, p. 54.
[94] *Essays on Several Important Subjects in Philosophy and Religion*, 1658, Essay V, p. 5.
[95] *Op. cit.*, p. 335.

entire Cartesian view. He said that "the best philosophy derives all sensitive perception from motion, and corporal impress," and that "the diversity of our sensations ariseth from the diversity of the motion or figure of the object." He did not, however, so much deny as doubt the existence of qualities like hot and cold in the external objects, because he thought all such questions to lie beyond the range of human knowledge and to be temptations that lead men into the vanity of dogmatizing.[96] Henry More accepted Descartes more fully at this point. [97]

Of course the more conservative thinkers objected to this disturbing dualism and supported the peripatetic school. Samuel Parker merely ridiculed Descartes for questioning that we directly and immediately perceive external objects. He overstated his point badly.[98]

Descartes cries, You rabble of philosophers think you are looking at the sun and moon and other such things. Truly remarkable! Just as if you could not be mad or asleep. I tell you that earth is nothing, sun is nothing, heaven is nothing. You have no head, no eyes, no body; all these things are dreams of men asleep or delirium of men insane. You say you have a body; but in truth you are not far different from the demented persons who claim they are gourds or are blown out of glass. Such indeed in the folly of Descartes. Yet we may reply that what he calls our dreams are less absurd than the reasonings of his philosophy.

John Keill and John Sergeant expressed much the same criticism more soberly at the end of the century.[99] But the more influential forces in England were on Descartes' side

[96] *The Vanity of Dogmatizing*, 1661, pp. 87-89.
[97] E.g., in his letter to V.C., in *A Collection of Several Philosophical Writings*, 1662, p. 114.
[98] *Op. cit.*, 489-91 (freely translated and abridged).
[99] Keill, *An Examination of Dr. Burnet's Theory of the Earth*, 1698, pp. 7-8; Sergeant, *Method to Science*, 1696, pp. 2-5, *Solid Philosophy Asserted*, 1697, "Preface," and *Non ultra*, 1698, pp. 10-63.

(or he on theirs). In 1690 Locke could adopt the Cartesian position without arousing much opposition; and in 1713 Arthur Collier could accept the position without arguing for it because it had been sufficiently proved by Descartes.

4. Even the thinkers who accepted the Cartesian dualism of idea and object were adversely critical of Descartes' views of both corporeal and spiritual substance (*res extensa* and *res cogitans*).

Henry More expressed his criticism of Descartes' treatment of *res extensa* in his first enthusiastic letter to Descartes on December 15, 1648. His initial point was that the definition was too broad, because (as will be noted again below) spiritual substance is extended too. But his chief point, and the one on which more English thinkers agreed with him, was that Descartes erred in identifying extension and matter. Matter is extended, to be sure; but it is also "sensible." In other words, extension is not the whole essence of matter. Extension is immovable, and matter is not; and hence extension is not sufficient as a definition of matter. Moreover, that can hardly be the essence of matter which fails to distinguish it from what is not properly a substance at all.[100] This line of criticism continued in England; and in a footnote to Rohault's very Cartesian *System of Natural Philosophy* Samuel Clarke summed up what seems to have been the accepted position on this point in England by the end of the century.[101]

It does no more seem to follow from hence; that, because we conceive extension before any other properties of matter, and that those properties can't be conceived to exist, without first conceiving extension; therefore extension is the essence

[100] *A Collection of Several Philosophical Writings*, 1662, p. 62. Cf. also the letter to V.C. in the same volume, p. 124; and the *Divine Dialogues, the Three First Dialogues*, 1668, p. 103.

[101] Part I, Chap. VII, Sec. 8, n.

of matter; than it follows from hence, that existence is conceived before all other properties of matter, and therefore existence is the essence of matter. . . . Not extension, but solid extension, impenetrable, which is endued with a power of resisting, may (as was before said) be more truly called the essence of matter.

Ray and Howard said substantially the same thing; and Sergeant claimed that no one can imagine a thing that has only extension and is not also either dense or rare, either hard or soft, either fluid or solid, etc.[102]

Not less adverse was the usual criticism against Descartes' view of *res cogitans*, though it was usually confused and halting. At the very first Descartes seemed a welcome ally against Hobbes. Hobbes had said, in his objections to the *Meditations*, that "mind will be nothing but the motions in certain parts of an organic body."[103] And Descartes so explicitly rejected that materialistic view that he appeared as a champion of the spiritual world. Digby (in spite of disappointment that Descartes would not go on to discuss immortality fully) hailed him for teaching that "when all body is abstracted in us, there still remaineth a substance, a thinker, an ego, or I, that in itselfe is no whitt diminished, by being (as I may say) stripped out of the case it was enclosed in."[104] Glanvill praised "the noble Renatus Des Cartes" for removing immaterial beings far from corporeal affections, so that it is impossible to ascribe "the soul's high effects" to bodily motions.[105] And Cudworth approved an atomism that admitted

[102] John Ray, *The Wisdom of God, Manifested in the Works of the Creation*, 1691, pp. 3-4; Howard, *op. cit.*, pp. 113-14; Sergeant, *Method to Science*, 1696, "Preface dedicatory."

[103] Cf. *The Philosophical Works of Descartes*, edited by Ross and Haldane, 1912, II, 65, 69.

[104] *Two Treatises*, 1657, Second treatise, p. 80.

[105] *Essays on Several Important Subjects*, Essay IV, p. 11.

that "no cogitation can possibly arise out of the power of matter."[106]

Gradually, however, this praise of Descartes' doctrine of *res cogitans* gave place to query and eventually to vigorous hostility. The question arose whether thinking is the essence or merely an activity of the soul. Though the latter was Hobbes's position and might seem to make materialism credible, many English critics tended to take this side of the dilemma. The soul does not always think, it was argued; and hence unless some substance be posited to do the thinking, the continued existence of the soul (and its immortality) would seem to be endangered. Davies ventured to assert that Descartes, just because he identified the soul with thinking, really played into Hobbes's hands; and his point was repeated by Henry More and Parker.[107] Increasingly opinion inclined to the conclusion that the essence of the soul was something other than thinking, though great confusion reigned as to what this something is. More maintained that the soul is extended, but differed from matter in being "indivisible, penetrable, and indiscerptible."[108] He did not ever carry out his Neo-Platonic tendencies as logically as his friend and pupil Lady Anne Conway, who frankly asserted that body and spirit differ only in *modo,* not in *essentia, i.e.,* only in the degree of their separation from God.[109] But he

[106] *Treatise concerning Eternal and Immutable Morality,* p. 302.

[107] Davies, *op. cit.,* pp. 52-58; More, *The Immortality of the Soul,* pp. 53-54; Parker, *op. cit.,* pp. 538-39.

[108] Cf. his *Enchiridion metaphysicum,* Chap. XXVIII (translated in Glanvill's *Saducismus triumphatus,* 1681).

[109] Cf. *The Principles of the Most Ancient and Modern Philosophy,* 1692, which is a translation of her book back into English from the Latin in which it first appeared. This book, though little known, is one of the most genuinely Neo-Platonic writings of seventeenth-century England; it is far more consistently and logically Neo-Platonic than any writings from the Cambridge Platonists themselves.

at least tried to give some solution of the problem, whereas most critics rested content merely with rejecting Descartes' theory. The controversy did not prove a profitable one, and Locke did little at this point to throw light on the issues involved.

5. Descartes' arguments for the existence of God received much the same reception in England as his doctrine of *res cogitans*. They were welcomed at first as an aid to religion; and then they were gradually attacked as containing undesirable implications. They were embraced at the outset by those who were worried by Hobbes's claim that "we have no idea of God."[110] Henry More went so far as to call them "perfect demonstrations," and said they would make further doubt concerning God impossible.[111] In his *Antidote against Atheism* he praised the ontological argument that existence is necessarily involved in the idea of perfection; but he gave only qualified approval to the further argument that the "indelible character of God" on our souls could not have come from any cause except God himself.[112] But other writers were more hesitant in accepting the theology of Descartes. They were made suspicious at once by the fact that Descartes had entirely rejected the teleological argument which was a bulwark of faith among bishops and ecclesiastics generally. Parker accused Descartes of indulging in mere sophisms, insisting (among other less competent points) that we have no right to suppose any idea, even the idea of perfection, to imply existence.[113] Davies dealt with the argument that the idea of God in our

[110] *The Philosophical Works of Descartes*, ed. by Haldane and Ross, II, 67.

[111] The letter to V.C. in *A Collection of Several Philosophical Writings*, 1662, p. 124; cf. also *The Apology of Dr. Henry More*, printed with *A Modest Inquiry into the Mystery of Iniquity*, 1664, p. 486.

[112] Book I, Chap. VIII and IX.

[113] *Tentamina physico-theologica de Deo*, 1665, p. 257.

minds could have come only from God himself. He acknowledged the authority of the old principle (utilized by Descartes) that a cause must have at least as much perfection as its effects; but he claimed that, since the soul was a substance and its ideas, even the idea of God, were mere representations, the soul might itself be the cause of the idea of God.[114] Cudworth gave a telling judgment on the Cartesian position. He wished to reject no reasoning, however weak, that helped any person to believe in God. So he reviewed Descartes' ontological argument, summing up what could be said both for and against it, and leaving his readers to decide its merits for themselves (though probably inclining against its conclusiveness himself). Then he stated the issue to be, not the existence of a necessary being, but a decision as to whether what has existed from all eternity is "a perfect being and God, or the most imperfect of all things whatsoever, inanimate and senseless matter."[115] And on this major issue he found Descartes, because of his rejection of proofs from final causes, decidedly weak. English opinion on the whole regarded Descartes' theological reasoning as not useless, but inadequate.[116]

6. Perhaps the most bitter debate on ideas advanced by Descartes was over universal mechanism. As it was Descartes' success in giving mechanical explanations of various events in nature that led to his first enthusiastic reception

[114] *Op. cit.*, pp. 63 ff.

[115] *The True Intellectual System of the Universe*, pp. 721-28.

[116] In the light of the English reception of Descartes' arguments for God, it is interesting to refer to the amusing passage in Daniel's *A Voyage to the World of Descartes*, 1692, p. 157. A Chinese mandarin is reported to have warmed the hearts of Cartesians by professing that consideration of Descartes' arguments was followed eventually by conversion to belief in God; but he soon cooled the Cartesians by adding that the inadequacy of Descartes' arguments had made him curious about other theologians' contentions and so had led him to the works of St. Thomas Aquinas whose teleological reasoning had won his assent!

in England as the enlightened leader of the "new philosophy," so it was his treatment of nature as a wholly mechanical system operating according to unbroken laws that eventually aroused the most intense controversy. His espousal of universal mechanism was what led some people, in spite of his arguments for God, to call him an atheist. Even Cudworth (who characteristically rendered balanced judgments) wrote that the Cartesians "have an undiscerned tang of the mechanically-atheistick humour hanging about them."[117]

An instructive essay which perhaps can be taken as representative of much English thought in the seventeenth century is Robert Boyle's *A Disquisition about the Final Causes of Natural Things* (1688). Boyle seems to have disliked equally any appeal to final causes in explaining a particular thing and any denial of the right to resort to such an appeal. Certainly his practice was constantly in accord with the idea of mechanism; but his philosophical theory made room for the idea of Providence. In this respect he may probably be taken as fairly typical of the members of the Royal Society. He remained friendly to Descartes and pointed out that Descartes had denied, not final causes, but the possibility of our knowing them. He thought it safe to follow Descartes' lead in science, without coming to a wholesale skepticism about the evidences of design in nature. He was surely quite Cartesian when he said that "a naturalist, who would deserve the name, must not let the search of knowledge of final causes, make him neglect the industrious indagation of efficients."[118] And he granted that Descartes was one "from whom I am not forward to dissent."[119] Yet at the same time he held that we have evidence in nature of

[117] *The True Intellectual System of the Universe*, p. 178.
[118] Page 237.
[119] Page 32.

God's solicitude for men. We may not be able to fathom all of God's purposes; yet we can, Boyle thought, detect some phases of Divine Providence. "I see not why the final causes, or uses, that appear manifestly enough to have been design'd, should be excluded," at least when we are explaining, not a single thing or event, but "the general causes of the world itself." Descartes' intransigent opposition to teleology he spoke of as "somewhat invidiously proposed."[120]

Under the leadership of Boyle and other experimental workers of kindred mind there grew up a tendency to distinguish between Cartesianism and the position of the Royal Society. This tendency became a firm principle after the appearance of Newton's great book. But even earlier it was not uncommon. As many Englishmen in the Restoration rejected Calvinism in theology because it seemed blasphemously to subject men to an inexorable fate, so they rejected universal causation in physics because it seemed entirely destructive of human responsibility and freedom as well as of Divine Providence.[121] Though Henry More had in 1653 been "ravished with admiration of his [Descartes's] transcendent mechanical inventions," he criticized Descartes mildly in 1662 for refusing to investigate final causes, and asserted that not all events in nature are mechanical; and in 1668 he became so violently anti-Cartesian as to write that "there is no purely mechanical phenomenon in the whole universe."[122] At last he had come to fear that ac-

[120] Page 28.

[121] Cf. Henry More's account of his rejection of Calvinism in his school days, "Praefatio generalissima" of his *Opera omnia*, 1675, I, v-vi; also cf. his distinction between Cartesianism and the position of the Royal Society in the "Praefatio ad lectorem" of the *Enchiridion metaphysicum*, 1673, Secs. 10 and 11.

[122] Cf. *Conjectura cabbalistica*, 1653, p. 104; the letters to V.C. in *A Collection of Several Philosophical Writings*, 1662, p. 124; and *Divine Dialogues*, 1668, "The publisher to the reader."

cording to Descartes' theory "all the particular usefulnesses of the creation are not the results of wisdome or counsel, but the blinde issues of mere material and mechanicall necessity." And Cudworth, opposed as he was to the peripatetic tradition, wrote that on final causes Aristotle's system is more consonant with piety than the Cartesian.[123]

> This latter makes God to contribute nothing more to the fabrick of the world, than the turning round of a vortex or whirlpool of matter; from the fortuitous motion of which, according to certain general laws of nature, must proceed all this frame of things that now is, the exact organization, and successive generation of animals, without the guidance of any mind or wisdom. Whereas Aristotle's nature is no fortuitous principle, but such as doth nothing in vain, but all for ends, and in every thing pursues the best.

Cartesian principles, he believed, because they derive the whole universe from "the necessary motion of matter . . . without the guidance or direction of any understanding nature," do not really account for "the orderly regularity and harmony of the mundane system."[124]

John Ray, fellow of Trinity College, Cambridge, and member of the Royal Society, supported this same position in his discussion at Cambridge, and appealed to Boyle and Cudworth as his authorities. He spoke caustically of "a sort of professed theists, I mean Mons. Des Cartes and his followers," and condemned them for "pretending to solve all the phenomena of nature . . . by a sleight hypothesis of matter so divided and moved." He regarded them as even more insidious in some ways than the explicit materialists.[125]

> These mechanick theists have quite outstripped and outdone the atomick atheists themselves [Epicurus and Democritus], they . . . will have their atoms never so much as once

[123] *The True Intellectual System of the Universe*, p. 54.
[124] *Ibid.*, p. 175. Cf. also Lady Conway, *op. cit.*, p. 147.
[125] *Op. cit.*, pp. 20-25.

to have fumbled in these their motions, nor to have produced any inept system, or incongruous forms at all, but from the very first all along to have taken up their places and ranged themselves so orderly, methodically and directly; as that they could not possibly have done it better, had they been directed by the most perfect wisdom.

And then Ray proceeded to develop the teleological argument for the existence of God in great detail, drawing his evidence from such things as the inclination of the axis of the earth, the formation of the foetus, the beating of the heart, the division of the backbone into vertebrae, etc.

Teleology thus aroused opposition to Descartes more than anything else. His critics asserted that the true import of his philosophy was summed up in the phrase "Give me space and motion, and I will construct the universe." To many Englishmen during the Restoration he above all others (even above their own Lord Herbert of Cherbury) seemed to foster deism. Why, it was asked, should one trouble to demonstrate God if one then goes on to banish him from his world? Keill said that Descartes "was the first world-maker this century produced," and was the animating spirit behind subsequent similar efforts.[126] If the world and everything in it, even the bodies and behavior of animals,[127] were produced and regulated "by the necessary laws of mechanism, without any extraordinary concurrence of the divine power," then, so far as we can tell, matter alone may have existed from all eternity and God need not be supposed to exist at all.[128] Parker offered an amusing explana-

[126] *Op. cit.*, p. 14.

[127] No one in England (excepting always Antoine LeGrand) seems to have accepted Descartes' theory that animals were unconscious machines. More protested on this point directly to Descartes in 1648 and often afterward. Cf. *A Collection of Several Philosophical Writings*, pp. 63, 110; and *An Antidote against Atheism*, Book III, Chap. 11. Cf. also Ray, *op. cit.*, pp. 38-39.

[128] Keill, *op. cit.*, pp. 19-20.

tion of why Descartes, who professed theism, drifted into a subsequent theory of universal mechanism.[129]

I do not think that he was impious from the outset in the spirit of his meditations. Yet, since he came to his studies from a military life without any learning other than mathematics, he thought he could construct worlds by that same mechanical means by which he had very cleverly constructed camps and posts. Whatever indeed he may have intended, he so handled his philosophical work that by his method of philosophizing he quite suppressed all possibility of a knowledge of the author of nature.

Thus on many points the ideas of Descartes became controversial points. The method of doubt, innate ideas, epistemological dualism with its subjectivistic implications, material and spiritual substance, theistic proofs, and mechanism were all discussed in their bearings on the materialism or Platonic idealism or experimental science of one or another English thinker. The early burst of overenthusiastic adulation of Descartes thus gave place to more measured and careful estimates on detailed points. And then it fell to Locke to usher in the last phase of Cartesian influence in seventeenth-century England.

V

Locke can no more properly be called a disciple of Descartes than any other English philosopher. Yet he deserves special attention in any account of Descartes' influence in England, not because he is intrinsically more important than any other English critic of Descartes (though this is true), but because of the enormous prestige he enjoyed in his own day and during the ensuing century. Subsequent English philosophers started with him, rather than going back to Descartes. (This is true even of Hume, who lived and studied

[129] *Op. cit.*, p. 281, translated from the Latin.

near Descartes' old home in France for a number of years.) Locke's *Essay* was thus in a way the end of direct Cartesian influence in England; for though the literature dealing with Descartes was abundant in the late 1690's, it ceased about 1700 when the authority of Locke's *Essay* was fairly well established.

Locke recognized to a certain extent his indebtedness to Descartes. He acknowledged, as has been already said, that Descartes' writings aroused him in his student days to an interest in philosophy. He rejoiced in reading Descartes, "because, though he very often differed in opinion from this writer, he yet found that what he said was very intelligible; from whence he was encouraged to think that his not having understood others had possibly not proceeded from a defect in his understanding."[130] He spoke of Descartes as "that ingenious author" and "that justly-admired gentleman."[131]

It is doubtful, however, whether Locke recognized the full extent of his indebtedness to Descartes. He was of course quite honest in objecting to Stillingfleet for saying that he had borrowed his ideas from Descartes; he believed himself that his ideas were spun out of his own independent reflections and "were not, that I know, derived from any other original." But claims to independence are always dangerous in any thinker, and Locke, it must be remembered, grew up and carried on his thinking in close touch with the men who at Cambridge and Oxford and London had been prominent as Descartes' critics. Even though he could rightly say that he was not "the scholar of so great a master"

[130] Quoted from Lady Masham's letter to Le Clerc on January 12, 1705, in which Lady Masham summed up what Locke had told her shortly before his death. Cf. Fox Bourne, *op. cit.*, I, 62.

[131] Cf. his *Works*, 11th ed., 1812, IV, 48. This volume of the *Works* contains the correspondence of Locke with Stillingfleet, the Bishop of Worcester.

as even Descartes,[132] he could not correctly estimate the amount of Cartesianism that came into his thinking through the controversial atmosphere in which he spent the formative years of his life. Moreover, it is not where he most clearly gives evidence of having borrowed directly from Descartes, but rather where he unconsciously adopted Cartesian ideas, that his Cartesianism is most important both in his own thought and in subsequent history. An effort will here be made, after noting the cases of direct borrowings from Descartes in Locke's *Essay*, to show how Locke transformed certain Cartesian principles and also how Descartes controlled Locke's thinking at some other very crucial points.

Locke's direct (and probably quite conscious) borrowings from Descartes occur chiefly in the middle of the last book of the *Essay*. He took over Descartes' method of finding the bed rock of metaphysical certainty in the fact of self-consciousness; he repeated Descartes' proof of the existence of the self ("If I doubt of all other things, that very doubt makes me perceive my own existence"); he turned next, like Descartes, to demonstrate the existence of God and used therefor one of Descartes' arguments; and he then, and only then, proceeded to inquire whether or not we can know the existence of an external world of material things.[133] Self, God, and the world were Descartes' three successive steps. That they were Locke's three steps too (with kindred reasoning on at least the first and the second) can hardly be a coincidence and could hardly have escaped his own notice.

On a series of other points scattered through the *Essay* Locke was clearly attacking Cartesian ideas. And the motivation of his attack is not far to seek. For where Descartes

[132] *Ibid.*, p. 48.
[133] *Essay*, Book IV, Chaps. IX-XI.

was confident of the power of reason to reach certainty through clear and distinct ideas (once God's existence was established), Locke was cautious, hesitant, tolerant of conflicting opinions on many matters, and quite skeptical. Locke was a generation later than Descartes; he not merely realized how claims to certainty endangered political and ecclesiastical stability and peace, but also perceived how Descartes' scientific ideas were being constantly discarded by experimental investigators. Descartes had been a system builder who would, given space and motion, construct the universe. Locke aimed rather to reach probabilities that would be useful in guiding us to prosperity in this world and salvation in the world to come. He was a keen observer; but he regarded his observations as disclosing bits of a world that remained largely unknown, and he emphasized, in quite un-Cartesian fashion, the limits beyond which no vision however acute could carry human knowledge.

Locke therefore followed Descartes' former English critics in refashioning the Cartesian method of doubt. At times his *Essay* reads like paragraphs out of Glanvill.[134] But, unlike Glanvill, he was thoroughly aware that he was not following in Descartes' path at this point. Surely Descartes could never have said, "I consider myself as liable to mistakes as I can think thee."[135] Nor would he have written that "the comprehension of our understandings comes exceeding short of the vast extent of things," or that "our business here is not to know all things, but those which concern our conduct."[136] Gone from Locke's pages are all traces of the histrionic doubt by which Descartes swept aside in one preliminary gesture the opinions of others, only in order to

[134] Cf. for example *Essay*, Book IV, Chap. IV, Sec. 24.
[135] *Essay* "Epistle to the reader."
[136] *Essay*, Introduction, Secs. 5 and 6.

set up new dogmas. Ever present in his pages is evidence of the un-Cartesian skepticism that became more profound as the full import of his position dawned on him.

Locke's attack on innate ideas can be shown to be aimed, not directly at Descartes, but rather at the Cambridge Platonists and enthusiastic sectarians in religion and politics who abused the idea badly. Indeed, in so far as Descartes meant by innate ideas those ideas that are in themselves certain, Locke sympathized with him; at least Locke granted that certain truths can be intuitively and demonstratively known, and even that they can be known with exactly the same certitude to independent investigators at distant parts of the world. But none the less Locke modified enormously the Cartesian use of the recognition of our ability to know such truths. Such truths, he maintained, are not (aside from the proofs of the self and God) concerned with real existence; some of them are mathematical and ethical principles, but most of them are "trifling propositions." He wrote that he had never known any one but Descartes to make the mistake of believing that "the certainty of the being of any thing might be made out from the idea of that thing."[137] Clear and distinct ideas, he explicitly said in the second edition of the *Essay,* might better be called determinate and determined ideas; and we should thereby mean only simple ideas immediately before the mind or complex ideas composed of precisely specified simple ideas.[138] And this explicit insertion into the second edition of the *Essay* was aimed at those who thought he wanted, like Descartes, to go from ideas in the mind to necessary existence outside the mind. We are lucky if we have clear and distinct ideas; but we must not suppose such ideas to be certain disclosures of the nature of the world around us.

[137] *Works,* IV, 50-51.
[138] *Essay,* "The Epistle to the reader."

The skepticism that Locke would substitute for the confidence of Descartes affected at once his treatment of God, material substance, and spiritual substance. In the case of God Locke rejected the ontological proof though accepting the proof based on the idea of cause. The ontological proof, he wrote in the *Essay,* "I will not here examine." But he made the examination later at length, and concluded that since "real existence can be proved only by real existence," no ontological proof of God or anything else is at all possible.[139]

In the case of the doctrine of material substance Locke's break with Descartes is more striking. His initial and explicit criticism is comparatively slight; but his final judgment is in complete opposition to Cartesianism. The initial criticism is a mere repetition of what others had been saying in England. Extension, he insisted, is not matter. It does not include the idea of resistance to motion of another body; its parts are not separable and movable. Matter on the other hand does afford resistance, and its parts are both separable and movable.[140] Yet when Locke added solidity to the geometrical properties of matter, he was still somewhat Cartesian. And in the famous passage of the *Essay* where he discussed primary and secondary qualities of material substance,[141] he seems himself to have felt akin to Descartes' position. Though solidity is always added to the primary qualities of matter, Locke was still like Descartes in supposing that the results of physics are ontologically sound and final. And he was too thoroughly Cartesian in spirit and background to realize fully the inconsistency of this passage with

[139] *Essay,* Book IV, Chap. X, Sec. 1; and a paper written in 1696 on "Descartes's proof of a God, from the idea of necessary existence, examined," in Lord King, *op. cit.,* pp. 312-15.

[140] *Essay,* Book II, Chap. XIII, Secs. 11-14; Book IV, Chap. VII, Secs. 12-13.

[141] *Essay,* Book II, Chap. VIII, Secs. 9-23.

his other conclusions. In the fourth edition of the *Essay* he changed the opening sentence of this section, and spoke of "qualities . . . such as are utterly inseparable from the body" instead of specifying what those qualities are. But he went on in the same paragraph to give a list of these qualities again and did not further revise the Cartesian character of the passage in even the last edition of his work.

The final judgment of Locke, however, was much more skeptical. Substance, he wrote, is "only a supposition of he knows not what support of such qualities which are capable of producing simple ideas in us; which qualities are commonly called accidents." It "is supposed always something besides the extension, figure, solidity, motion, thinking, or other observable ideas, though we know not what it is."[142] The real essence of things may be quite different from the nominal essence by which we designate them to ourselves and to other men. The primary qualities of bodies thus turn out eventually to be convenient ways of thinking of substance rather than the actual nature of things. And when Locke took this stand, he broke with the most important element in Descartes' thinking, namely that we can truly know the real nature of the world around us.

Similarly with Locke's treatment of spiritual substance. When he said that we intuitively know ourselves, he was in direct dependence on Descartes. But when he said that we cannot hope ever to know what spiritual substance really is, he wrote in accordance with his own skepticism. And the two positions were never brought into harmony with each other. The soul, he definitely decided in opposition to Descartes, does not always think; thinking is its most important activity but not its essence.[143] What it truly is we can no more

[142] *Essay*, Book II, Chap. XXIII, Secs. 2-3.
[143] *Essay*, Book II, Chap. I, Secs. 10-19.

know than we can penetrate the real nature of matter. Well might Stillingfleet say:[144]

> We can have no certainty upon these principles, whether we have any spiritual substance within us or not. . . . The most men may come to in this way of idea's is, that it is possible it may be so, and it is possible it may not; but that it is impossible for us from our ideas, to determine either way.

And the logic of Locke's skepticism becomes apparent when he acknowledged that it is quite possible that God might endow material substance with the power to think. Though Locke insisted that we know from revelation that God has not given matter the faculty of thinking, he had to confess that only revelation could save him from the total and ruinous skepticism toward which his philosophy was headed.[145] And this skepticism cut right across Descartes' whole philosophical enterprise and made impossible the kind of science of nature which it was Descartes' most earnest hope to establish.

If we had at this point finished our discussion of Locke's relation to Descartes, we would have to conclude that Locke owed little to his French predecessor. The places where he explicitly followed Descartes were far less important than the places where he rejected and transformed Descartes. But the account is incomplete. It is not simply that Locke did do various things to Descartes in making over Cartesianism into a skepticism, but also that Descartes did various things to Locke (quite unsuspected by Locke so far as the evidence goes) in controlling Locke's thinking on important points. Three such points are important to note.

First of all, Locke followed Descartes in holding to a

[144] *A Discourse in Vindication of the Doctrine of the Trinity*, 2d ed., 1697, pp. 242-43.
[145] *Essay*, Book IV, Chap. III, Sec. 6.

rationalistic ideal of scientific knowledge. As Descartes had intuition and demonstration as the two degrees of knowledge, so did Locke. Locke asserted at times that only intuition and demonstration are properly to be called knowledge. He did to be sure recognize what he called "sensitive knowledge"; but he was hesitant on this third degree of knowledge and inclined rather to call it "probability" or "judgment." The empiricism and skepticism of Locke were so marked and emphatic that it is hardly likely that he would have reached the rationalistic ideal of knowledge through following out his own independent line of thinking. It is therefore highly probable that he is here under the influence of Descartes. "If we could discover," he wrote, "the figure, size, texture, and motion of the minute constituent parts of any two bodies, we should know without trial several of their operations one upon another; as we do now the properties of a square or a triangle."[146] And it is significant to note that Locke retained this rationalistic ideal even though he also was driven to regard it as utterly unrealizable for human beings. "As to a perfect science of natural bodies," he wrote, "(not to mention spiritual bodies,) we are, I think, so far from being capable of any such thing, that I conclude it lost labour to seek after it."[147] If Locke had not followed Descartes in regarding mathematics as the only legitimate kind of science, he might not have been plunged into the complete skepticism in which his *Essay* eventuated. But Descartes' hold on him was too firm. He remained Cartesian at this point even though all the logic of his *Essay* pointed in an opposite direction.

Similarly Locke followed Descartes in accepting the dualism between ideas (or sensations) in the mind and objects outside of the mind. Of course many others had taken some-

[146] *Essay*, Book IV, Chap. III, Sec. 25.
[147] *Ibid.*, Sec. 29.

what the same position, so that it might be suspected that Locke reached this dualism through other influences than Descartes'. The actual dependence of one thinker on another in the absence of explicit reference by one to the other, is hazardous to assert. Yet there is some warrant for holding that we have here another case where Locke was more dependent on Descartes than he ever realized. For in the case of the other English advocates of epistemological dualism in the seventeenth century, the principle was a device for ridding nature of qualities which physics could not easily handle, and the logical implications of the principle were not noticed or discussed. With Locke, however, as for Descartes himself, the dualism was a genuine ontological predicament and, consequently, the only legitimate starting point for serious philosophical reflection. Descartes of course solved the difficulty of this predicament by his theory that all clear and distinct ideas are true. Locke had no such facile solution and was therefore headed into the skepticism with which his *Essay* is filled. But though the two men differ in their handling of the predicament, both of them—and no one else in the century—realized the full importance of the predicament for philosophical theory. Indeed Locke may be said to have appreciated better than any other English writer in the seventeenth century the logical consequences of holding that sense experience is subjective in character. He reiterated over and over again that a man has no other immediate objects in thinking than his own ideas.[148] Other Englishmen had hailed Descartes at this point for some such reason as that the point seemed to favor a spiritual interpretation of the world. Locke alone accepted it with the full realization of its implications for theory of knowledge and metaphysics. And this fact seems to indicate that Locke

[148] *Essay*, Introduction, Sec. 8; Book II, Chap. VIII, Sec. 8; Book IV, Chap. I, Sec. 1; etc.

was under Descartes' influence quite deeply, far more deeply at least than he himself realized.

And finally Locke, unlike the majority of Descartes' other English critics, took over the idea of universal mechanism. He did not hesitate to believe that bodies "have a constant and regular connexion in the ordinary course of things."[149] He did not even recoil from applying the idea to the human will. "Liberty is not an idea belonging to volition, or preferring; but to the person having the power of doing, or forbearing to do, according as the mind shall choose or direct."[150] Hence "it is as insignificant to ask whether man's will be free, as to ask whether his sleep be swift, or his virtue square; liberty being as little applicable to the will, as swiftness of motion is to sleep, or squareness to virtue."[151] Of course Locke may have reached this determinism through his own reflection—and historians of ideas should not make the mistake of supposing that a man never formulates any ideas in his own right and as the result of his own independent thinking. Without any desire to depreciate the originality of Locke's own contribution to philosophy, it might, however, be said that Locke was so familiar with the writings of Descartes that he could hardly have reached independently an idea that is omnipresent in those writings. Locke may well have failed to realize his dependence on Descartes on this point, because, once he had the idea, he would have found confirmation of it in his contacts with experimental science. But he probably owed the principle to Descartes, even though he himself could not trace it to that source.

Locke's sponsorship of universal mechanism in physical nature and human affections and volitions did not arouse

[149] *Essay*, Book IV, Chap. III, Sec. 28.
[150] *Essay*, Book II, Chap. XXI, Sec. 10.
[151] *Ibid.*, Sec. 14.

the opposition and vituperation with which Descartes' sponsorship of the same idea was greeted. The reason probably is that Locke's skepticism prevented him from carrying out the idea as much in detail as Descartes did. Locke never formulated any specific laws of universal connection in nature. He granted the principle and professed his inability to apply it. We cannot have knowledge of nature through any of our theories "till we are made to see what qualities and powers of bodies have a necessary connexion or repugnancy one with another."[152] But (aside from the famous chapter on Power in the second book of the *Essay*) Locke had no sensational conclusion to draw from the principle of universal mechanism. English thinkers were not shocked by a belief in mechanism that had so little practical consequence. And it is historically fair to say that the idea became current in England rather through Locke's incorporation of it in his skeptical system than through Descartes' more assured and uncompromising advocacy of it.

We may conclude that Locke was more of a Cartesian than he recognized. His direct incorporation of ideas from Descartes was a tribute to the Frenchman but made little difference to the course of his own reflections. His direct attacks on Descartes did not so much eliminate Cartesianism from the *Essay* as adjust it to the intense skepticism of that work. The subtle and unsuspected ways in which Locke remained constantly under Descartes' influence were historically most important of all. For when Newton and Locke superseded Descartes as philosophical writers which Englishmen would continue to read, a certain amount of Cartesianism was handed down to later generations in England through the pages of Locke's *Essay*. It was said above that it was a "truncated Descartes" that was known to the eighteenth century so far as direct acquaintance with Descartes is

[152] *Essay*, Book IV, Chap. III, Sec. 15.

concerned. It was also a chastened Descartes that was preserved to the eighteenth century in Locke's pages. But it was something of Descartes anyway, even though a Descartes who had learned to distrust the human mind and to be skeptical concerning all proffered knowledge of nature. Locke however, had an almost universal audience. Historically, it was Locke who passed on to subsequent times whatever of Cartesianism survived beyond the turn of the century in 1700, as it was Locke who through his popularity was responsible for the comparative obscurity into which Descartes' own writings fell.

One final word may be added in regard to the importance of the Cartesian element in Locke's thinking. The eighteenth century did not so much refute as ignore the part of the *Essay* in which Locke made direct borrowings from Descartes, so that, had there been no other Cartesian elements in Locke, it would have been almost wholly cut off from Descartes' influence. But it was very aggressively and insistently concerned with the three Cartesian principles which (if the analysis just set forth is correct) Locke accepted and built into the structure of his *Essay*. The course of philosophical speculations in England for two or more generations after Locke was partly animated by a desire to reject the rationalistic ideal of mathematically necessary knowledge; it was continually troubled by epistemological dualism, though it rather abandoned than solved the problem; and it was greatly interested in the principle of universal mechanism. The last of these three Cartesian principles is in fact consonant with the naturalistic tone which English philosophy has predominantly had from Locke's time to our own day—though it would be a bold inference to assert that the naturalistic tone was derived from the Cartesian materials that Locke incorporated in his *Essay*.

LOCKE'S ESSAY

FREDERICK J. E. WOODBRIDGE

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JOHN LOCKE'S *Essay concerning Human Understanding,* considered by itself and as its author would have it considered, is a humane and practical document. Considered in the light of its subsequent history, it has defined the major problem of modern philosophy, the problem, namely, of experience and nature. Locke himself was more of a moralist than a logician or a psychologist. His excursion into the use of language and his analysis of the way in which the understanding comes to have ideas, had a very definite moral purpose attached to them. It was that men should subordinate speculation to conduct, not because speculation is either worthless or illegitimate, but because conduct does not need to wait upon it. "The candle that is set up in us shines bright enough for all our purposes." Speculation may afford us a foretaste of what purely intellectual beings are capable of in a state different from our own, but it does not define the purposes of men, who are very far from being purely intellectual beings. These purposes are defined by the daily exigences of living, and these exigences are not only met before we have any ideas about the constitution of things generally, but have to be dealt with in their own terms irrespective of what our speculations about that constitution may be.

Our business here is not to know all things, but those which concern our conduct. If we can find out those measures, whereby a rational creature, put in that state in which man is in this world, may and ought to govern his opinions, and

actions depending thereon, we need not be troubled that some other things escape our knowledge.

Our business here is business, education, society, and politics. These are matters of human experience irrespective of any account of that experience which ventures to go beyond the evident and recurring emergencies of experience itself. For all these our candle shines bright enough. Speculation is not denied, but it is irrelevant to practice as practice defines itself, for practice is a matter of taking risks instead of having certainty. "He that will not eat 'till he has demonstration that it will nourish him; he that will not stir 'till he infallibly knows the business he goes about will succeed, will have little else to do but to sit still and perish." The *Essay* is, thus, a protest against sitting still and perishing. It would have us go to school, into business, society, and politics because by going we fulfill the purposes of human living. If we let our going wait upon some speculative justification of it, we are in great danger of not going at all, and that is to defeat the evident purposes of life.

The *Essay* is also a protest against the major consequence it had in modern philosophy. It accomplished something different from what Locke intended. Irony has pursued it. Locke delayed the publication of his *Essay*. I have often wondered how much longer he would have delayed it, had he foreseen the consequences it was to have. Such wondering is, of course, idle, but the consequences form an ironic comment on the moral purpose of the author of the *Essay*. We see the inevitability of them, because we have the means of seeing how they came about; and so we are led to estimate Locke in terms of the consequences he provoked instead of in terms of the consequence he desired. He wanted to encourage philosophers to throw the theory of knowledge into the waste basket. He succeeded in putting it on their desks.

He provoked among them the conviction that he could not succeed in doing what he attempted to do, unless he first succeeded in doing what he thought could not be done. A theory of knowledge alone could get a theory of knowledge out of the way; and to get it out of the way by getting it first, became the first task which many philosophers thought they must accomplish before they could go on to anything else. In short, history followed Locke's procedure instead of his advice. It continued writing essays concerning human understanding in order to show that we had better go to experience for the purposes of life.

I doubt whether Locke's successors in this enterprise have advanced much beyond him. They have had more advantages—progressive natural sciences, more abundant data about human nature, more psychology, and more refined methods and instruments of analysis. The fundamental obligation, however, remains much the same, namely, that of setting experience in the context of nature, of placing experience in relation to that which is wider than itself, and finding this relation to be the crux of the problem of knowledge. Locke forces himself and his readers to consider the problem of this relation as the ultimate, but unsolvable problem of knowledge, and then begs that it be ignored. His successors would, some of them, follow him in this, and others would keep the problem alive as an active spur to speculation.

Although Locke would have his readers ignore the relation of experience to nature, he did not ignore it himself. He allowed his conception of it to define the conditions under which he developed his argument. He might have proceeded differently. Instead of asking first how we acquire the materials of knowledge when an empty understanding is set over against nature defined in terms of Newtonian physics,

he might have asked quite simply, what do we do when we explore our evident surroundings, exalting thus the exploration of our surroundings above the exploration of the understanding? He gives evidence enough that he might have proceeded in this way. The suggestion of it is repeatedly indicated. It is what he ultimately recommends. He did not follow it however. His intellectual honesty compelled him to recognize that, in dealing with the theory of knowledge, he started with an antecedent theory of nature and that this forbade his accepting a theory of experience as itself a theory of nature or of the physical world. With him experience was neither nature nor a sample of it. It was something other than nature, and nature went its own way, indifferent whether experience happened or not.

Here an important corollary of Locke's position emerges, namely, nature or the physical world is continuous in its own terms and as such is irrelevant to the occurrence of human experience. Although this experience is a product of nature, it is a product which leaves the continuity of nature untouched. Experience may be, as it were, anchored to nature, but floats in suspension, much as a tethered balloon floats above the earth. Or, in the imagery of Santayana, it is like a dream which would be wholly dream, were it not for the fact that it gives hints of possible movements which fit in with what the scheme of nature allows. In other words, nature has generated experience without ceasing to be what nature is without that generation.

It is this aspect of Locke's *Essay* which has made it historically so conspicuous and so powerful. It expressed so unmistakably the principle that every theory of experience carries with it a theory of nature, and that the theory of nature controls the theory of experience. Nature may be conceived with all the vastness which the Newtonian system

opened to Locke's imagination or modern astronomy opens to ours, or it may be stripped to the bare bones of subject and object; experience remains as somehow nature's product and can be neither identified nor defined except by contrast. Obviously the term "experience" may lose the meaning it had with Locke and his successors; it may be used only as an alternative name for being or for our evident surroundings or for the obvious subject matter of inquiry; but let it have its historical connotation, let it be *my* experience as distinct from *yours*, or *human* experience as distinct from other than human, *then* nature is implied. For then experience has a context. It must be placed. It makes little difference in this respect by what means it is placed, whether by faith or by reason, whether by hypothesis or by evidence, whether by theory or by practice. It will own a context and that context will determine what experience is then made out to be. Otherwise how can we understand such facts as the control of Locke by the Newtonian system of the world or the control of much philosophical thinking about experience today by modern physics and astronomy with their demands on mathematics and logic? Is it not all clear evidence that we want to be sure about nature in order to write an account of human understanding, and so discover the character of human experience? Experience as experience, yours, mine, ours, human, has to be placed, and nature is the name for its placing, either as domain or source.

It is this principle that a theory of experience implies a theory of nature, that makes Locke's theory of knowledge intelligible and explains those so-called contradictions in the *Essay* which require little wit for their discovery. Given Locke's theory of nature which was Newton's system, it may be said that his theory of experience had to be pretty much what it was. Experience had to be a product of nature with-

out being itself nature, and all our knowledge had to be a product of experience, for experience was its only subject matter. This left the relation between experience and nature something outside the reach of knowledge altogether. It is easy to charge Locke here with a contradiction fatal to the soundness of his examination of the original, certainty, and extent of human knowledge. It is more profitable, however, to consider the limitation on knowledge which he felt himself forced to make as a consequence of his theory of experience. He was forced to define knowledge in terms which were relevant to experience alone but not to nature. He thereby reduced knowledge to the perception of those relations within experience which imply nothing beyond the direct perception of them. This made knowledge quite incompetent for the management of our business in this world. It had to be supplemented by belief, judgment, and probability. Estimates of what is likely to happen became more important for the conduct of life than knowledge of what is certain. That what we eat will probably nourish us is obviously more important than that a square is not a circle.

It can be argued that such an outcome of his theory of knowledge ought to have weakened Locke's confidence in his theory of nature. It did not, however. He was too well aware that it was his theory of nature which led him to the necessity of restricting knowledge so narrowly. And, it may be added, he was too well aware that living, irrespective of any theory at all, is a highly problematical affair. His theory of nature was necessary to demonstrate successfully this problematical character. He went from nature to experience and saw, as clearly as any of his critics has seen, that it was hazardous to reverse the process. Without nature it was impossible to label experience "experience" in any intelligible sense. "To what purpose, then, all this stir!" he makes him-

self and his readers cry. Knowledge of nature is denied us. How can we then regard experience as nature's product or find a place for it? How can we know anything at all about the matter?

Locke's answer sounds pitifully weak. We do not know, but we may be assured. It is, however, an honester answer than is often given in similar cases. Too frequently philosophers go from nature to experience, from experience to knowledge, from knowledge to probability, and then turn nature into a synthesis of experiences or the limit which probabilities approach. Locke's assurance is not of this sort. It is not a matter of probability. The grounds of it were with him partly religious and partly stubborn. He could not believe that God put us into the world to be wholly deceived about the constitution of the world he had made. Nor could he believe that efforts to find out what that constitution is are vain and futile, only God had not imposed upon us the obligation of finding it out first of all in order to live decently and humanely. If we confidently follow the light of the candle of experience, we may find assurance enough that we are not walking wholly in the dark. It shines bright enough for all our purposes.

The answer may still be called weak. It may, however, be regarded as a commendation of the *Essay's* power. It turns the *Essay* into a notable document which declares that assurance of nature is prior to assurance of experience. I do not mean any more than Locke meant that we begin with knowing what nature is. I mean, rather, that we do not begin with knowing what experience is. We discover it. It is something we isolate and circumscribe, but we isolate and circumscribe it within a context. We tie it up, precisely as Locke did with a living animal's career and fate and eccentricities. We may eventually put it in the animal's head or

consciousness or mind, leaving the animal's body to go its own way among other bodies, or to become the fleeting symbol of something more substantial than itself. Without the assurance of a context in which all or any of this is done, the whole procedure is quite unintelligible. And it is only as the isolating and circumscribing proceeds, that there ever arises the problem of the relation of experience to nature.

Locke was not the first philosopher to discover experience. His historical significance lies in the manner in which he delineated the discovery. He made of it primarily a matter of moral significance. "Our business here is not to know all things, but those which concern our conduct." He contended stoutly for the principle that whatever cognitive significance experience may have or engender is not for its own sake, but for the sake of human living and its betterment. He contended that the study of experience without the aid either of speculation, justification, or divine revelation can make clear what the processes of betterment are. There is no doubt at all about better health, better education, better politics, better society. To doubt the adequacy of their empirical justification is to cease to be human. His intellectual honesty, however, forced him to see that all this involved the placing of experience in a context. Otherwise experience is neither discovered nor distinguished. He stuck to this at the risk of appearing patently contradictory and even ridiculous. To what purpose all the stir? To a significant purpose in spite of contradiction and ridicule—to escape the absurdity of leaving experience without the background of nature. He would not so leave it. His obstinacy here may bewilder his readers. It may also instruct them.

They may, perhaps, learn from the *Essay* that it is the disengagement of experience from nature that gives to experience the character of an exploration and exploitation of

the context in which it occurs. It becomes the means of knowing. To turn this means into an impediment in the way of knowing what nature is or into a distortion of nature which makes nature inaccessible to reflection, is to do something that looks extravagant indeed. We are well enough assured that the disengagement of experience is the work of nature and we are well enough aware that a consequence of it is the necessity and thirst for knowledge. The theory of knowledge would then seem to be the theory of what is known, the theory of nature and of nothing else. The adequacy of nature to experience is fully as much of a problem as the adequacy of experience to nature.

Perhaps I have gone too far in drawing such a moral from Locke's *Essay*. Yet I see it illustrated in his book. His trouble was not with experience, but with his theory of nature. He showed with clarity and honesty that this theory was not adequate to experience. He lets himself be generalized. Born three hundred years ago he can still be a commentary on those three hundred years.

SPINOZA: ART AND THE GEOMETRIC ORDER

HOWARD SELSAM

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It is a commonplace that any philosophic system owes something of its virtue and influence to its esthetic appeal. Whether the philosopher wish it or no, men will find in him more than logic. There is beauty in the mystic yet logical world of the Plotinian enneads, in the superlative dialectic of the Thomistic synthesis, in the architectonic of the *Critique of Pure Reason*. A common medieval tenet held that goodness, beauty, and truth were three manifestations of being, distinct yet related one to the other in an intimate though a logical manner. If that be so, this element of art in philosophies, of intellectual beauty and emotional excitation, may be conceived as possessing metaphysical significance, as giving an insight into the logical order from which it springs. In most cases, indeed, it is gratuitous, in that on its presence or absence the system neither stands nor falls. But a philosophy is often a way of life and a way of life must take into account the emotions, and, to win adherence, must appeal to them. Let it be granted that such appeal is frequently extrinsic to the nature and structure of the philosophy itself. It may have its source in the author's style, his wit or his power of vituperation, his moral fervor or his social bias. On the other hand, there are philosophies in which artistic perception is a function of their inmost nature. Such a philosophy is Spinoza's. In it metaphysics and ethics, theory and practice, are homogeneous. If it provides an emotional stimulus for the influence of practice, that emotional

appeal lies in its own theory and method. Knowledge of the truth is the highest good and the forms of knowing are beautiful. Without the aura of artistic perception all its ethical teaching is vain and pointless. But before proceeding to discuss the *Ethics* it would be well to indicate sketchily the nature of the esthetic values of philosophic systems.

These values, apart from the beauty of the language itself —and from Plato to Santayana masters of prose have not been wanting—are primarily of two kinds. The more obvious one, first, is that of form or structure. The philosopher orders his universe, creates an edifice like unto that of the architect or the musician, balancing part against part, and designing the whole to one purpose and one end. The second esthetic element is harder to depict, though it is no less real. The philosopher shares it with the mathematician, and it has its source in the very nature of reasoning itself. Just as the mathematician can find music in the manipulations of numbers and the demonstrations of geometry, so can the philosopher see beauty in his intuitive grasp of first principles, his *a priori* arguments, and his chains of deduction. Anselm's ontological proof and Descartes' *Cogito ergo sum* have an appeal which is extralogical. One may deny their cogency, but one cannot ignore the emotion with which they are understood. It is not to our purpose to subject this to detailed esthetic analysis. It is sufficient to note that they give that immediate grasp of an object, that vividness of perception, which is the very essence of art, and one might even suggest the *a priori* argument as the perfect type or symbol of the esthetic experience. It is reasoning which, in a sense, has ceased to be discursive. A statement which is the warrent for or guarantee of its own truth possesses to a preëminent degree that immediacy which is the prime characteristic of esthetic experience. In similar manner the mind not only

knows a truth, such as the Pythagorean theorem, which follows necessarily from given premises, but also takes pleasure in such knowledge. There is beauty, further, in the peculiar organic nature of a deductive system in which, as Plotinos says, "all is in act at once." The part draws its force from its union with the whole and each proposition contains potentially all the other propositions of the system.

Various commentators on Spinoza have ascribed divers reasons for his use of the geometric method in his *Ethics,* and have found different results arising therefrom. No one would venture to maintain that he chose this method for esthetic reasons. Yet that these played a part may not be so absurd as it first appears. Since the rise of romanticism, the heart and the mind, emotion and reason, have been violently torn asunder, much to the injury and degradation of both. It is held today that when men urge us to follow our feelings rather than our intellects and place the heart above the head they are either seeking support for a religious system which reason was impotent to uphold or are endeavoring to escape from an external world which had been mercilessly stripped of all values. Spinoza's achievement lay in his envisioning the possibility of a perfect union of the emotions and the intellect through finding the highest emotional values in knowledge of the world of metaphysics and physical science.

But first it would be well to consider the basic problem of Spinoza's moral philosophy. This may stand out more clearly if examined with Aristotle's ethics in the background. Aristotle recognized the paradox in the Socratic-Platonic notion that evil is ignorance, and that to know the good is to follow it. He argued that a man might know what is right and yet do the wrong because of habit, the strength of the emotions, and the inability of the practical reason completely to over-

come them. The function of the practical reason or prudence appears nowhere more clearly than at the close of the first book of the *Magna moralia*. Reason is a kind of steward of philosophy and its business is to procure leisure for it by subduing the passions and keeping them in order. But this is as far as Aristotle went. In order that the speculative reason, through the exercise of which man's supreme happiness is obtained, may perform its function properly, the passions must be held in subjection. And for this there is no other means than the practical reason which is limited and thwarted by habit and the emotions. Aristotle was apparently content to let this dilemma remain, but it is just here that Spinoza's problem is laid. "Reason," he says, "has no power to lead us to the attainment of our well-being."[1] Only through the highest kind of knowledge, the direct revelation of the object itself to the understanding, is love evoked.

> So that when we get to know God after this manner then (as he cannot reveal himself, nor become known to us otherwise than as the most glorious and best of all) we must necessarily become united with him. And only in this union . . . does our blessedness consist.[2]

Spinoza agrees, then, with Aristotle that we may know what is right and yet do wrong, but he offers a solution. In his religious terminology, there is a supremely perfect Being, and it is possible for man to have a direct intuitive knowledge of him, and by this knowledge to become so united with him in love that nothing in nature can possibly destroy this union or exercise sway over it.

Manifestly, this highest kind of knowledge can no more be imparted by one man to another than can the mystic's vision. The nearest approach to it is found in a deductive

[1] *Short Treatise*, Wolf trans., 1910, II, Chap. XXII.
[2] *Loc. cit.*

system, and until recent years the clearest and most compact form of this was that of Euclidean geometry. It was the most potent instrument Spinoza could have used, and potent in a more significant way, for his moral purpose, than in simply giving an unassailable argument. For by this method such demonstration is produced as not only convinces the intellect but wins the emotions as well.

John Bouwmeester has asked Spinoza "whether there is or can be such a Method that by means of it we can proceed safely and without weariness in the consideration of the most exalted subjects?" Spinoza replied that there must necessarily be a method "by which we can direct and concatenate our clear and distinct conceptions" and that this follows alone from the fact that one clear and distinct conception can be the cause of another and that, in truth, all such that we form can arise only from others which are in us.[3] Further, if we bear in mind what Spinoza meant by the highest kind of knowledge—the intuitive *seeing* of a thing, perceiving it through its essence—and connect this with the goal of his ethics—the attainment of blessedness through the intuitive knowledge of God—one need no longer wonder why he employed the method he did. No other method of presentation, even if his conclusions had been demonstrated with equal cogency and with greater freedom of form and beauty of style, could have served his moral end as well as does the mathematical method. Instead of a hindrance, then, as it has sometimes been regarded, to the proper presentation of his moral philosophy, it is through its esthetic value the most effective vehicle of his thought. It would be foolish to underrate the logical and metaphysical reasons for his choice of method, but ultimately they are inseparable from the esthetico-moral reason. When Spinoza asserts that God is the

[3] *Epis.* XXXVII, Wolf trans., 1928, p. 227.

cause of the universe as the definition of a circle is the *cause* of its properties he is not drawing an idle analogy. The geometric method is not simply a means of expounding his conception of the system of nature, but his conception is, from the first, geometrical. He made a cosmic generalization of the formal cause as he interpreted it in geometry. But it is not enough to know the metaphysics underlying his method of exposition, for it is essential to the understanding of his moral theory to grasp the peculiar emotional effect this method had on Spinoza and was meant to have for his readers. Our contention is that there is a most intimate and inescapable bond between Spinoza's moral doctrine and the type of method by which it is expounded.

Unfortunately, Spinoza never developed a theory of the beautiful or said more than that beauty "is not so much a quality of the object which is perceived as an effect in him who perceives it."[4] If to this is joined his assertion that we judge a thing to be good because we desire it, rather than desiring it because we judge it good, it is not difficult to find a purely subjective hedonistic esthetic. But this is to ignore the metaphysical setting of both doctrines. It must be recognized, first, that in the Spinozistic system there is no ultimate dichotomy of thing and thing known; secondly, that the mind has the power of arranging and associating emotions (modifications of the body) according to the intellectual order, by forming clear and distinct ideas and deducing them one from another.[5] Then we shall find that beauty is objective, in any significant sense of the term, and that there are criteria of beauty subject to discursive formulation. Thus there is here neither a crude realism nor an unpalatable nominalism, and that Spinoza found beauty in a form of

[4] *Epis.* LIV.
[5] *Ethics*, V, *Prop.* x.

knowing is more than a psychological fact. His understanding grasped that infinite substance without which nothing can be or be conceived, and he found in that knowledge the source of man's true happiness. It is this vision which he wished to impart to his followers, and there was for him no more efficacious means than the geometric method. By such knowledge one not only sees that something is so, and why it must be so and cannot be otherwise, but perceives in it a fittingness, a perfect felicity. And such perception is not only of the utmost importance for morals in Spinoza's thought, but it is one of the foremost traits of all esthetic experience.

It is to the last three books of the *Ethics* that we wish particularly to devote our attention. That does not mean that the books on God and on the mind are wanting in such esthetic values as we have attempted to describe. But it is in the parts on the emotions, on human bondage and freedom, that these values are richest and the geometric method becomes a medium of the highest artistic expression. Parts IV and V are the last acts of the great cosmic drama in which man, caught in the flux of changing things in a Nature which does not change, strives for happiness and the preservation of his being. Throughout the contrasts of light and darkness, the alternations of hope and despair, the interweaving of divers propositions out of which by the sheer play of dialectic the solution must come, there is superb art in the unfolding of Spinoza's inexorable deduction.

Spinoza believed that he was the first to define the nature and strength of the emotions and the mind's power to restrain them. He was confident that the emotions could be understood in the same way as the nature of all things is understood. In themselves they are neither good nor evil, but they have their definite causes and particular properties,

the contemplation of which affords us delight. It is not without moral significance that Spinoza could take pleasure in contemplating anger, envy, and hatred, as well as courage and nobility, for it is precisely in our power to know these emotions of which we are not the adequate cause that our freedom from their tyranny begins. To know an emotion is to know not only its nature and effects but the proximate cause on which it depends, to understand that principle in accordance with which it is generated, and to know such principles is to know a part at least of the system of nature.

As for his actual method of discussing the emotions, Spinoza tells us himself: "I shall consider human actions and desires in exactly the same manner as though I were concerned with lines, planes, and solids."[6] This is not to destroy their richness, variety, and complexity. It means for Spinoza simply that the emotions are intelligible. To consider them in the geometric manner is to study their generation through universal laws and rules of nature, out of man's position in the world of extension and thought. And it is further, as suggested above, to enjoy knowing them, for when the mind knows in this manner it regards itself and its own power of activity, and feels pleasure.[7] When it refers emotions and passions to universal laws it is referring them to the idea of God, and thus the mind's pleasure is accompanied by the idea of God; hence the mind loves God.[8] Thus it is manifest that for Spinoza's moral end we must conceive the emotions clearly and distinctly, and the reason he is going to treat them in the manner of geometric figures is that by this method they may best be known, such knowledge will give delight, and we will love God.

[6] *Ethics*, III, Introduction.
[7] *Op. cit.*, III, liii.
[8] *Op. cit.*, IV, xv.

Part III of the *Ethics,* then, in keeping with these requirements of Spinoza's moral thought, is not only a superb example of deductive method but a consummate work of art. It would take us too far afield to analyze the book in terms of general esthetic canons or the values of particular arts, but to point out a few will sufficiently illustrate its esthetic qualities. There is first the architectonic of the logical order of the emotions. That this particular order is an arbitrary one need not be gainsaid. Any other order of equal architectonic merit would do as well. The point is that for knowledge there must be an order and with the order the esthetic value follows. Man, like all things in nature, endeavors to persist in his own being. As he is conscious of this endeavor he has desire. Since he desires he feels pleasure and pain, and as pleasure and pain can be accompanied by the idea of an external cause, there arise the emotions of love and hate. Out of the fact that emotions can be associated accidentally one with another arises the possibility of loving or hating a thing without a known cause; hence appear sympathy and antipathy. In this manner the whole gamut of the emotions is run, each generating others according to the order of logical priority.

In the course of this deduction a second esthetic value appears, that, namely, of recognition. There is this pleasure even in an astute empirical description of the emotions, but as experience can give only inadequate ideas of them an empirical description or a poetic portrayal can merely make these ideas more vivid. Thus, although there is the pleasure of recognition in such descriptions or representations, it is deepened and intensified when each emotion is seen as a logical consequence of given definitions and axioms. For then the inadequate idea of experience is seen in the adequate idea of reason, and being so recognized the two are

fused and the pleasure of a heightened consciousness of oneself and of God results. A striking example is found in Proposition 35, where jealousy is deduced. "If anyone conceives that an object of his love joins itself to another with closer bonds of friendship than he himself has attained to, he will be affected with hatred towards the loved object and with envy towards his rival." This is neither a description of a human feeling nor is it proved by reference to experience. It follows, rather, from Propositions 34, and 30, and 28, and 31, 11, 13, and the corollary of Proposition 15. In the recognition of this emotion thus demonstrated as something in our own experience a peculiar pleasure is found, a pleasure like that which, as Aristotle pointed out, the spectator finds in Greek tragedy. But here it is more effective, even to the point of uncanniness, when we recognize our intimate personal feeling as one with that deduced from the postulates and theorems of Spinoza's metaphysical system. Obviously, the actual existence of a world, of men, and of passions is irrelevant to the truth of Spinoza's thought, for if there were these entities which fulfilled the requirements of the definitions of the system, this deduction would hold of them. But it is precisely in this, that we do recognize these passions so demonstrated as our own, as the adequate knowledge of that which had been known only inadequately, that both the esthetic value and the moral significance of the third part of the *Ethics* are found.

In Part IV Spinoza's artistry is at its height. The emotions dispassionately contemplated in the foregoing part are now subjected to scrutiny in the light of the definitions of good and evil. With the first proposition the book opens in a minor key. If a true idea, by virtue of its being true, can remove no positive quality possessed by a false idea, then there is and must be human bondage. Each succeeding propo-

sition, for a time, plunges us further into darkness. Since it is impossible that man should not be a part of nature, he must undergo changes of which he is not the adequate cause, and is necessarily a prey to his passions. This is the difficulty unanswered by Aristotle. Yet out of this very series of propositions in which human weakness is presented so vividly, a suggestion of the possibility of man's freedom comes. An emotion can be controlled only by a stronger contrary emotion, and the knowledge of good and evil is itself an emotion.[9] Thus, although a true knowledge of good and evil cannot destroy a passion because it is true, it may do so in so far as it is an emotion. There is hope here and a suggestion of the way of salvation; yet Spinoza continues to show in successive propositions the weakness of this knowledge of good and evil before the strength of the emotions by which we are assailed. He carries us so far into darkness that he feels it necessary to explain his purpose. He has shown why true knowledge yields to every kind of passion only because by so knowing our infirmity are we able to determine what reason can and cannot do in restraining our emotions.[10] As far as this question is concerned, Part IV goes no farther. Out of the very group of propositions which depict human bondage arises the possibility of freedom—in the knowledge of good, or a good, the emotion of which is stronger than all other possible emotions. But what is such knowledge and wherein can it be found? The answer to this question, the way to happiness, Spinoza reserves for the last part, "Of Human Freedom."

A large portion of Part IV is devoted to the life of reason, or, more nearly in Spinozistic terms, the course marked out for us by reason. The various emotions are examined in

[9] *Ethics*, IV, vii, viii.
[10] *Op. cit.*, IV, xvii, n.

order that we may know which are in harmony with human reason and which are not. Lest it be thought that Spinoza, in making the control of the emotions the central theme of ethics, is conceiving the subject too narrowly, it must be borne in mind that for him even more than for Aristotle, the problem of the emotions is as broad as that of human life. To live well as an individual and as a member of society is to have emotions which are in accord with reason, and all moral education consists in the proper direction of the emotions. But it must be noted that this section in which the emotions are treated in the light of reason is purely theoretical, inasmuch as it has not been shown that men can abide by the precepts of reason. The life of the free man is described, but the possibility of freedom has not been proved. Spinoza asserts that for the present he is content to treat of human infirmity and will deal later with the power of reason over the emotions. Therefore, from the standpoint of the demonstration man's salvation is yet precarious and uncertain. The pall of gloom over the opening of the book has not really been lifted, although the life of reason has been apotheosized.

In sharp contrast with the preceding part, the tone of the last book of the *Ethics* is lofty and serene. A bright light plays over its intricate demonstrations. From the second proposition onward the power of the mind manifests itself. Soon the path to the love of God appears, the possibility of immortality is derived from the nature of the mind, and salvation, freedom, or blessedness is found to be within man's reach.

Spinoza's way of salvation is far from that of the Stoics. The emotions do not depend absolutely on our will, nor can they be dominated or suppressed by brute resolution.[11] Nor

[11] V, Introduction.

is man constantly to meditate upon death. The wise man thinks of it least of all things, for his wisdom is a meditation, not of death, but of life.[12] There is not Stoic negation and denial, but acceptance and affirmation. The good man is determined to action by pleasure and not by pain. Unlike the Stoic, he thinks not of the evil in things but of their good when rightly used. Thus, instead of lamenting the vanity of the world, decrying the fickleness of mankind, the vices of the rich, or the inconstancy of women, he strives to gain a true knowledge of the virtues and their causes and to fill his spirit with the joy which arises from such knowledge. This difference from the Stoics contributes to the esthetic effect of Spinoza's *Ethics*. It makes human bondage more somber since it is not within the power of our will to escape, and it makes freedom more joyous since it is achieved through pleasure and not through pain. Thus the very nature of his moral theory, combined with the use of the geometric method and the sharp division of the last two parts, causes Spinoza's system to be felt as well as known. It may be true that no philosophical system is known unless it is *seen* or grasped intuitively. Of Spinoza's *Ethics* this is especially true, but with the addition that it is of no avail unless it is not only *seen* but enjoyed, not only understood but understood with the proper emotion.

The mind is able to cause the destruction of love or hatred by disassociating an emotion from the thought of an external cause and uniting it with other thoughts.[13] By forming a clear and distinct idea of an emotion which is a passion we bring it about that it ceases to be a passion.[14] The mind, further, by understanding all things as necessary, has

[12] IV, lxvii.
[13] V, ii.
[14] V, iii.

greater power over the emotions.[15] We are less subject to an emotion and it is less hurtful if it springs from reason, *i.e.*, is referred to the common properties of things or to God. This knowledge of God, if it does not actually destroy the passions, at least causes them to occupy a very small part of the mind.[16] Thence Spinoza goes on to consider immortality or the way in which the mind can understand things under the form of eternity and thereby itself become eternal. Through this we are brought to the last proposition of the book, which is the keynote of the whole demonstration and the culmination of Spinoza's moral system. Up to this point all propositions are seen as following from those which had preceded, but now suddenly the end appears before us and we find a true final cause which throws a new meaning and a new light on all that has gone before. Virtually everything that is new and original in Spinoza's ethics is contained in these words: "Blessedness is not the reward of virtue, but virtue itself; neither do we rejoice therein, because we control our lusts, but, contrariwise, because we rejoice therein we are able to control our lusts."[17]

Man, to be free from the dominion of his passions, must have such a love as no other love nor desire can take away, and this can only be the love toward God, an infinite perfect being. This love can come alone from the third kind of knowledge, the immediate presentation of the object to the mind, which knowledge is referred to the mind in so far as it is active. This is virtue itself. Therefore, to know and to love God, to achieve happiness and to live virtuously, to be free and to attain salvation, are one and the same thing. Underlying this is a single idea with two facts: to know is to

[15] V, vi.
[16] V, xx, n.
[17] V, xlii.

refer things to universal principles, which is to refer them to God, and to do that is to accompany the pleasure of knowing with the idea of God as cause and therefore is to love God. Salvation is possible because men can know things intuitively in their immediate presence to the mind, for knowing in that way arouses emotions and ultimately an emotion which is stronger and has greater power of controlling emotion than all the passions to which, as part of a changing world, man is subject. Only, then, through the union of knowing with esthetic experience is human freedom attainable, and the roots of this union lie deep in the Spinozistic system. Knowledge and the emotions can be in harmony because knowing is not merely intellectual, and ethics is possible because a knowledge of good and evil is itself an emotion. It is Spinoza's perception of this which is the foundation of his ethics and which helps explain the fact that it is an *ethics* demonstrated in geometric order.

THE EMERGENCE OF SPACE AND TIME IN ENGLISH PHILOSOPHY

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The work of contemporary theoretical physics has emphasized the importance, for logic and epistemology as well as for physics and cosmology, of discussion about space and time. This reawakened interest justifies the examination and evaluation of the beginnings of space and time speculation in modern science and philosophy. Such an enterprise leads naturally to Newton's *Principia* and Locke's *Essay*, which summarized the scientific and philosophic currents for seventeenth-century English thought. Much of their importance, to be sure, lies not in their professed solutions, but in their suggestion of further problems which were at once attacked by Leibniz and Euler, Berkeley and Hume. But in contrast to a study of this historical and logical development following Newton and Locke there may be raised the prior questions of what traditions they themselves represented, why they found such problems on their hands, why indeed they found time and space presenting problems at all? Why did these concepts assume central philosophical importance in the English thought of the seventeenth century?

The physics of Galileo aimed to discover quantitative relations in change. Now implied in this approach were the assumptions, first, that there is something that remains quantitatively constant throughout change; and, secondly, that what changes are the quantitative and measurable relations of the parts of this something. In change conceived as motion, as the temporal and spatial change of measurable quantities

of matter, Galileo had a field whose terms and relations were alike subject to quantitative and mathematical formulation. Thus at the start we find at least three assumptions. (1) Physics is to discover and formulate the quantitative relations in motion. (2) The unchanging substances which move and are moved are definite quantities of matter, since by definition matter is that which alone remains quantitatively the same throughout change. In this notion of substance as a quantity of matter there begins to emerge the concept of mass or the amount of material in a body or a given system of bodies engaged in reaction. From this point of view matter and the mass of matter become absolutes since regardless of qualitative changes and variations quantitative changes are not admitted. (3) In motion these substantial and absolute quantities of matter change their measurable relations, which implies that in motion only spatial and temporal *relations* are involved. The mathematical determination of change means the quantitative formulation of the spatial and temporal relations of the fixed moving substances, not of any change in the amount of matter concerned. Matter is indestructible and in this sense may be called absolute. To the assumptions mentioned above may be added a fourth of different order and kind. Matter and mass are the measurable aspects of substances, and the question is at once raised as to the relation between these quantitative aspects and the qualitative aspects perceived in experience. An epistemological distinction between two kinds of knowledge is thus made, most cogently expressed in the dualism of Locke's primary and secondary qualities.

In the consideration of absolute mass there begins the need for postulating a field or place in which can occur the changing patterns of unchanging elements. In classical atomism we are acquainted with absolute particles and the void or a

dualism of being and nonbeing. Such a system did not pretend to offer any formulation of mathematical relations between its elements. Within certain limitations Greek and Latin materialism offered an explanation of phenomena by means of an analysis of the elements concerned; but it made no claim to explain them by indicating the place of these elements in an organized system of mathematically formulated relations. Ancient atomism, like Aristotle, neither started with measurements nor sought mathematical relations in its analysis of change in nature. Again, like Aristotle, it concerned itself not with relations between elements as such but only with the relations between elements and wholes, the relation calculated to give an answer to the "what" rather than the "how." A frame of reference is not set up within which the changing patterns of atoms can be determined, since the object is not to describe the precise motion of the elements concerned in a given phenomenon, but to discover what elements are involved.

In the light of this interpretation we can advance to a brief consideration of seventeenth-century thought. The substances or quantities of matter whose relations are determined in Galileo's mechanics, though measurable in amount and not by definition indivisible,[1] are within any system of moving bodies taken as the absolute, independently existing substances of Greek atomism. All motion is the motion of such absolute substances or masses. However, the analysis of motion discovers more than independent substances interact-

[1] In the distinction between divisibility and indivisibility there arises the terminology of corpuscles and atoms. Seventeenth-century science placed the weight of its authority on matter as corpuscular or divisible in contrast to the Greek notion that matter was indivisible or atomic. Quite obviously seventeenth-century physics did not intend divisibility to imply destructibility; the permanence of matter in change is essential to the whole seventeenth-century scheme.

ing; it discovers the precise changing relations of these substances, capable of expression in universal and constant mathematical terms. It finds substances changing their spatial relations in definite relation to the temporal relation of observations, and it finds a fixed rate of change for these spatial relations. But the determination of this rate of change of spatial relations of substances is possible only if measuring the rate of change is possible. For such measurement it seemed necessary to find something other than matter by which measurements of the rates of change could be made. It was necessary to determine *where* each mass was at each *instant,* what its changing positions were in a set of temporal and spatial relations. It is worth noting that in the very setting up of this dualism between matter and position a second dualism arises, *i.e.,* of material substances and their mathematical relations. The possibility of reducing matter to a class of mathematical terms is not suggested at this time. The economy of thought in Greek atomism is abandoned in favor of two new classes of things, mathematical relations and positions spatially or temporally determined. To be sure, to express accurately the where and when of events it is not necessary to invent space and time as something other than functions of the objects which are placed and dated. From the time of Aristotle, if not before, space and time had been reduced to the status of functions of body; objects and events had been located in terms of other objects and events. But the desire to measure absolutely phenomena compelled an investigation of the resources available for placing and dating. In so far as matter is contrasted with nonbeing, matter cannot be located intelligibly in its contradictory. To the extent that matter is located in terms of matter, *i.e.,* particle A is dated and placed by reference to B, C, or D, the absolute character of any one particle is jeopardized. Its existence

is made contingent upon the existence of all other particles, since it is only by reference to them that it can have a place to exist or to exert influence that is not contingent upon the existence of all other particles.

With such a background and such a possible series of consequences we are logically and historically prepared to find emerging space and time as something other than mere functions of the particles which have been avowed as the objects of scientific measurement. Space and time as independent entities offer themselves as the background necessary for the purposes of the new science. They acquire their separation from matter and their characteristics from the assumption that matter is absolute, an assumption maintaining by implication something other than matter as the locus for the changes that take place in phenomena. These changes are affirmed by definition to be such that the elements of the change cannot change in their nature but only in their position, appearing here and there, now and then. But the here and now are other than the elements located, since these elements are independent of location, and demand the existence of a mathematical system of locations in which to appear.

This bifurcation of nature into matter and a system of space and time finds philosophic expression in Gassendi's metaphysical classification of existents. Yet it is hard to see that Gassendi advanced beyond awareness of the problem and of the possibility of treating space and time *per se* as objects of discourse. That they are given a kind of independent existence separate from the existence of matter seems clear, but that he developed this concept or its implications for physics is doubtful. It is at least clear that the bifurcation had become sufficiently apparent for Descartes to feel its danger. He attempted to overcome it by identifying quantity of matter with extension rather than with mass, thus

introducing a monism of matter and space, a monism which in frankly denying any independent space affirmed the plenitude of matter.

Thus by the middle of the seventeenth century there had been advanced two definitions of matter. The Galilean gives absolute substance indestructible throughout change, implying the further existence of an independent space. The Cartesian in its insistence on extension denies independent space. In fact, the relations of quantites of matter are the object of Cartesian science, and by identifying matter with pure quantity, complete mathematical treatment is possible. The analogy with Aristotelian concepts is here obvious. Space is redefined as a function of body. This is important in that it forms the pattern for subsequent continental discussion about space. It explains the divergence of English Platonism and accounts for the relative space of Leibniz. The contrast to Gassendi is comparable to the contrast to Newton.

But the aim of seventeenth-century physics, the discovery of mathematical relations established by measurement, in contrast to the classical search for essences, has another important implication. The physics of Aristotle presented a spherical universe in which position was determined by reference to a fixed framework of relations assigned to the various elements. With the break-up of this system not only the earth but all other heavenly bodies needed a new framework. In the abolition of a standard reference the universe expanded according to the plan of infinity sketched by Bruno. Since any object might be "center" and the entire universe might be referred to that object, there could be as many universes as there were objects. The dialectic advanced to prove an infinity of objects need not disturb us here. The important point is the loss of form and the consequent problem of how it was possible to recreate form from the ele-

ments that had been analyzed out of the Ptolemaic universe by the Copernican logic. Comparable to the philosophic drama of the thirteenth century with its change from the Platonic tradition of Augustine, Erigena, and Anselm to the Aristotelianism of St. Thomas Aquinas is the corresponding change in the Renaissance to Platonism. If a *primum mobile* was an adequate postulation for the old cosmology just because the universe seemed adequate unto itself as a fixed, interdependent, and self-ordered system, such could hardly be true once this universe was dissolved into a changing, relative, and chaotic collection of sovereign parts. The need for order from within became apparent. It did not seem probable that a God apart could be sufficient as cause once the disastrous effects of relativism were apparent. Happily or unhappily according to one's hope in the reconciliation of theology and science there was present from the Platonic tradition of Augustine a God whose mind subsisted as a realm of mathematical relations and an intelligible space. If at one time idea had meant both pattern for and cause of this did not deter the eager Platonist from reforming the notion into that which could supply the inherent order that results from introducing a system of mathematical relations between parts. Platonism just because it had been a rival of Aristotelian science presented itself now not only as a criticism of that science but as a mathematical background before which could be placed the new science which was developing both as a protest to Aristotelianism and as a subject matter needing a mathematical system to give it coherency. But there was established the notion of a mathematical system of the universe as an expression or illustration of God's mind, and for the bolder spirits this mathematical system was identified with God's mind. The decision could be quickly made in favor of a Platonistic God; the difficulties inher-

ent in such a decision were only to be realized later, the immediate question being to decide whether the world order represented God's mind or was God's mind. Thus the new science was involved in an examination of God as well as of nature, since it had not been bold enough to attempt to erect a system of natural law independent of theological support. In the suggestions of Bruno that natural law is to be discovered within the system of nature there is obviously forecast the philosophy science would maintain later. However, when Bruno has placed natural law within nature he has further placed nature within God so that the separation of natural law from God is suggested only as a possibility if science were removed from the scene of God's intellect. That such a removal could have been effected at this date does not seem possible.

With the foundations laid by Galileo, Copernicus, Bruno, and Gassendi, continental Europe may be said to possess the rudiments of space and time as independent existents to be reckoned with in the philosophy of science. With the rise of Cartesian physics two new developments are outstanding. There is the rapid increase of a more potent geometry with its claim to a synthesis of Euclid with algebra, in short the perfection of a new mathematics for the interpretation of a system of mathematical relations. Simultaneous with this is the extension of materialistic hypothesis in physics, an extension so inclusive that the claims of the new spatial philosophy are defined out of existence. Matter is identified with extension, hence there can be no separate space existing as a place for body. Body is the exclusive and all-inclusive physical subject matter and the measurements in physics are relative to body and in terms of body. There is left no background or external framework as a source for terms of measurement. It is a universe once more relative in the Aristotelian sense.

So far two reasons have been advanced for the changed treatment of space and time. First, there is the desire for quantitative mathematical treatment. Because of this there developed in the Galilean physics a matter defined so as to imply logically an independent space and time. A division of Galileo's universe would yield principles, qualities, quantities, etc. The first comprise the means of explaining how qualities and quantities change and interact. To the extent that the investigation is restricted to quantitative measured changes we have what Galileo defined as physics. Among the principles useful and necessary to explain this particular class of physical phenomena we find space and time. Space and time are principles logically implied by matter, they are logical ultimates, simple and indefinable.

Second, there is the need for a fixed framework of reference. With the introduction of Platonism the Galilean interpretation of principles is modified. The quantitative changes of matter are subordinated to the metaphysical superiority of logical ultimates. In this change, space and time lose their methodological interpretation and acquire an existence which must be expressed as equal or superior to the existence of matter. It is a development which raises the question of the reality of space and time. Just as long as space and time were considered as principles their reality was not questioned; such a question would have been meaningless in Galilean terms. Once, however, the search for coherency began it seemed relevant to inquire into the nature of that which was postulated as the ground of all places and dates.

Attracted by the authority of Descartes' scientific account of nature yet repelled by his materialism, Henry More attempts an eclectic combination of the space and time theories of Gassendi with the Platonistic tradition of *logos* and the

relevant parts of Descartes' cosmology. Starting with the claims of the immaterial as primary the problem set is to introduce spirit into a plenitude of matter. The method of attack centers in the Cartesian definition of matter; while the result includes the Gassendian distinction of space, time, and matter. If that which is fundamental to Cartesian matter can be made to appear as likewise fundamental to the immaterial, then the immaterial is equally real with Cartesian matter. But such a conclusion needs differentia for matter and spirit. The answer could be found in Galileo for there matter had been treated as mass. Assume, then, More maintains, that spirit is extended, for then it is evident that spirit is just as real as the matter of Descartes. But even so we have not reduced spirit to matter for it is possible and indeed probable that by matter we refer not to extension but to extension possessing mass. If spirit is extended but lacks mass, then space represents most clearly what is meant by spirit. Have we not in space and the properties of space our best insight into what we mean by spirit? Developed with these notions is the Platonistic concept from Augustinianism that God is the source of order and coherence in the world.

In Barrow we find added to More's treatment a philosophy for time in which space and time as aspects of God's nature form the necessary background of all phenomena. If this background were missing the world would be unintelligible in the sense that the quantitative determination of nature would be impossible. God for English philosophy emerges simultaneously with space and time as supplying the terms for quantitative mathematical descriptions.

What does More mean when he adopts the Cartesian definition of matter for spirit and the Galilean definition of matter for the material? What is the significance of Barrow's quantitative account of time when time is defined as an

attribute of God? How are we to understand More's experiments for the "reality" of space and to reconcile this with his materialistic argument that space is "real" because the mind cannot possibly "dis-imagine" it? In short, when space and time emerge in English philosophy why do we find More and Barrow writing about them as they do?

The translation of space and time from a Galilean to a Platonistic setting had raised the question of "reality." Descartes' material plenitude had forced attention to the claims of spirit. Platonism saw order in the world as of divine origin and significance. The philosophy of Descartes had resulted in a God outside nature. Was it possible then to reconcile Augustinian-Platonism with this unique example of Descartes' Aristotelianism? The attempt is certainly made by More and in his definition of spirit and matter the disharmony of Platonism and Aristotelianism finds emphasis. Therefore, is it possible to show that this disharmony is but the contradiction subsisting between matter and spirit? From the Galilean point of view it was meaningless to inquire into the nature of space and time. But for Descartes they had been reduced to body. In this reduction is given the opportunity to inquire into the nature of time and space since they can be measured in common with the material. Now it seems clear that More begins his study from this point of view, *i.e.,* space and time are things that can be measured, not principles necessary for measurement. At the same time More is aware of the Platonic tradition urging the separation of space and time in that they are logically prior to other existents. Thus the conclusion is reached that space and time are separate, measurable existents. If this is true we have some explanation for More's empiricism and rationalism. To the extent that space and time can be measured experiments of a physical order are relevant to prove their exist-

ence. But in that they are Platonically real as necessary logical priors they are subject to the processes of reason leading to rational proof of their existence. They are mentioned in More's philosophy in that he found them prominent features in the system of the leading physicist and philosopher of his age. They are modified on the other hand in accordance with the tradition that had always furnished a haven to "spiritual" philosophers. By the time Barrow attacked the problem the foundations had been laid by More. Space and time are taken to be the kind of existents More had determined. There is only to be added a more refined quantitative treatment. The result is that space and time emerge in English philosophy as "things" which can be measured. Furthermore these "things" are open to sensuous and rational knowledge and represent for us divine attributes. Our third reason to account for More's space and time is that they afforded a means of attack upon seventeenth-century materialism. Starting as logically implied by matter, they then shifted their meaning to the logically prior to matter, developing to still a third position as a manifestation of spirit and an argument against a plenitude of matter.

The reasons for the emergence of space and time in English philosophy are implicit in this work. More and Barrow have directed their philosophies to a criticism of Cartesian materialism which results in an inclusion of parts of that philosophy in a Platonic setting. From the setting space and time emerge as the real locus of scientific and spiritual activities. Since this locus is real, it may be treated rationally and empirically. Space and time are things, they weaken the monistic claims of materialism, they enforce the real presence of God's attributes, and they are open to human knowledge and the requirements of physics.

For the construction of his *Principia* Newton had three

sources. (1) The physics of Galileo, with matter defined as mass, implied space and time as principles of motion. (2) The speculations of Descartes identified matter with extension. (3) The quantitative description of space and time with matter as mass were the conclusions of More and Barrow. Now, as is evident from the *Principia,* Newton favored his teachers, accepted their theories of space and time and their Galilean definition of matter. Unlike them, however, there is the remarkable development of mathematics which is his own. If the calculus may be understood as a logical expansion of the analytic geometry then we find Newton equipped with a method entirely adequate for a complete mathematical understanding of matter defined as mass. Through his mathematical acumen Newton forced the materialistic hypothesis to give new results. The discontinuous could yield measurements that could be worked over into formulae describing the continuous. The decision for Newton was with his Cambridge predecessors where space and time were in question; his chief debt to Descartes is in mathematics.

The Newtonian approach to space and time has a double aspect. On the one hand these words refer to absolute kinds of existents which together with absolute matter are the all-inclusive subject matter of physical science, the position in short suggested by Gassendi. Secondly, there is the question of space and time as measured. When "measure" means a "segment" or "part" of absolute space or time such "segment" is called relative. It is by using "measure" in this sense that Newton obtains his relative space and relative time. As Newton writes of them no evidence is offered that they are different kinds of existents from absolute space and time. A second space or time is not implied in the Newtonian usage. Given a segment of absolute space or time, *i.e.*, relative space or time, we can now apply to that segment a given

arbitrary segment of space or time such as yard or hour. "Yard" and "hour" are still segments of absolute space and absolute time different only in the sense that their quantity has been chosen and fixed. It is in the use made of yards and hours upon other segments that the second meaning of measure occurs. In this sense "measure" means the application of standards to yield a numerical result. Given a numerical result or number indicating the quantity of space or time, we can speak then as though the number were a measure. In this third usage measure has a meaning which is metaphorical with respect to the two preceding meanings in that the result of an operation is spoken of as an operation.

By such distinctions Newton sought to differentiate absolute space and time from the use made of space and time by physics. As absolutes they are things in themselves, existing as attributes of God which furnish the necessary matrix to hold all events in a coherent order and a fixed place. On this level absolute space and time are given the significance long awarded them by the Platonizing-theological tendencies of Augustinianism. When our analysis is extended as far as possible we get matter *in* space and *in* time and this space and this time are the physical manifestations of God who by definition is that Being who has created and who controls the order of nature. Natural law as something other than Deity has not emerged; space and time are the field of God's operations and God's presence constitutes the structure of the world. That such a result might be interpreted as pantheism was not unknown to Newton and his contemporaries. The favorite refuge was to point out that space and time were but attributes of God, a means of understanding part of his nature, and not the sum total of his existence. His essence must be sought in other definitions. So much for Newton's absolute space and absolute time which supply to us both a

partial knowledge of God and a basis necessary for the measurements of science, on the condition of course that matter has absolute mass.

In the experiment of the pail and its connection with the laws of motion we have Newton's attempted proof of the existence of absolute motion which appears valid if the general laws are admitted. But the proof is circular in that the laws have assumed what it is the purpose of the experiment to demonstrate. Clearly it is not relative but absolute motion and force which is referred to by the laws of motion. Thus when the pail is adduced as an instance of those laws it comes with little surprise that absolute motion is experimented upon. The origin of this problem lies much deeper and seems imbedded in the fact that, given absolute mass as the corner stone for a physics, absolutes of many other physical entities will follow, *i.e.*, if other entities are introduced they must be absolutes if absolute mass is to remain valid. How else is it possible for Newton to protect this absolute mass, unless this absolute mass can move in absolute space and time, with absolute motion, and by absolute force, if there can be postulated as the only possible change a change of position?

Since it seems clear that space and time have the same logical origin in Newtonian as in Galilean physics how are we to account for the difference in treatment? In the physics of Galileo space and time were postulated as the necessary principles for a measurement of motion. In the Newtonian definitions of absolute space and time as contrasted with the definition of relative space and time it was evident that the various meanings of measure applied to space and time and not to motion. By our measures of space and time we obtain measures of motion. Motion is not measured as the logically prior but acquires meaning from space and time. An absolute

motion is a motion in absolute space and time; a relative motion, one with respect to a measured segment of this space and time. Of course the meaning of space and time had been profoundly changed by More and Barrow. No longer principles but things, they claimed measurement as scientific objects. To the extent that they had become something outside of science, attributes of God, and in the absence of a clear definition of a suitable treatment for them, it seemed feasible to attempt to treat them with a scientific methodology. But why should they be "treated" at all? It is true that Barrow had attemped a quantitative measurement of time, while More's "experiments" indicate faintly a similar treatment of space. As suggested above, these efforts on More's part reflect the origin of his work as a protest to Cartesianism. In that system space was measured when body was measured. The separation of space from body did not immediately give space as a non-measurable thing. The emphasis at this period is upon the separate real existence of space and to the extent that space can be treated like body, the existence of space seems more clearly assumed. Consequently, the analogy between space and body is extended in the experiments or operations performed on space, a procedure indicating that the immaterial is as real for sense experience as the material. From this point of view Barrow offers a similar but more refined treatment of time. Time is a thing and the technique for understanding this thing scientifically is the quantitative mathematical method of physics.

In these terms we can find a provisional answer for English science "treating" space and time. But there is the further question of why Newton ever performed his experiment with the pail. The tradition of Platonism mentioned before supplies more than God as *logos* acting in space and time. In its English development space and time as divine attributes

are comparable to Platonic ideas except that they can be known by the senses and measured. Although they are no longer principles but things, they have retained their universality and immutability. The laws of motion on the other hand remain principles as space and time had for Galileo. They are open to rational knowledge alone and the suggestion is lacking that they may be treated empirically. This phase of Newton's physics shows the influence of Aristotelian logic. The laws of motion are principles in things which may be deduced from phenomena by experiment. These principles are revealed and then used, they cannot be analyzed or measured; as conceived by Newton their function is catalytic. The purpose of the pail experiment is to reveal empirically absolute motion. Now by definition absolute motion is in absolute space so the existence of absolute motion insures the existence of absolute space. At this point we find the experiment performed to demonstrate to the senses absolute space. Now it seems plausible that Newton was directed to this by the same traditions as More. Space is an existing thing and as such is amenable to physical treatment. But its existence as thing was not so secure as the existence of matter. Until the same security could be guaranteed space, the attempt to prove its existence seemed relevant.

If this explains why Newton had a pail experiment we must inquire next into the absence of experiments to prove the existence of time. To the extent that this experiment was designed to prove absolute motion it was possible to infer the existence of both absolute time and absolute space. It is remarkable that Newton seems concerned to apply the results of his experiment to the subject of space alone. The reason for this is found in Newton's treatment of space since we have knowledge of this existent when we perceive distance and when we measure. However, time is not perceived,

it can only be measured. Distance and position may be operationally defined but such treatment does not appear possible for space. Absolute space must be seen and in this seeing of space Newton holds that we have most certain demonstration of its existence. Such an opinion indicates very clearly Newton's agreement with one of the more fundamental tenets of English empiricism. This psychological difference between Newtonian space and time leads to the logical difference that while space can be apprehended and understood by the experiment with the pail, time is a limit which we approach as our timepieces become more accurate. From this aspect time is regular change and is revealed to sense experience by other regular changes. The accuracy of measure is equivalent to the accuracy of change in the object used for measuring. Such a theory offers no experiment which can prove time to exist, *i.e.*, there is nothing to be seen. All of this may be taken as an indication of how Newton attempted to widen the limits of empiricism. Absolute motion was to be demonstrated to the senses.

When these problems are expressed in the terminology of John Locke we find that we have abstract ideas of absolute time and absolute space while relative time and relative space give simple ideas. The simple ideas are acquired in sense experience, space is seen, time or change is experienced in the flux of ideas, abstract ideas are the products of reflection upon this data. This classification may be compared with the Newtonian. In that system relative space and time were segments of absolute space and time. Relative space was seen when a "part" of absolute space was chosen, relative time was the time of a timepiece. At this point the Newtonian and Lockean systems are in agreement. However, they part in the consideration of absolutes. Reflection upon Newtonian relative space yields nothing, it is given and there the ques-

tion ends. Its connection with absolute space is established by experiment and the laws of motion. Any given relative time is an approximation more or less exact to a standard, *i.e.*, absolute time. Again it is not a question of reflection but of technique, the technique of building more regular clocks. But although Locke and Newton agree that relative space and time are data, for Locke data for mind, for Newton data for the application of principles, they differ in that Locke seeks to classify relative space and time as simple ideas and as such they are modes of substance. Some light is thrown on the nature of this substance when we recall that absolute space and time are regarded by Locke as divine attributes. In this opinion we find another point of contact with Newton; they agree in giving absolute space and time existence, they are things and as things they are attributes of God. But Newton had maintained that they could be demonstrated by the methods of physics; what is the necessity of the Lockean notion that they are presented by reflection upon the relative? A possible answer is found by comparing Newton's principles with Locke's reflection. Principles are discovered in things, and once discovered may be utilized in explanation. Such a theory insists upon the empirical or sensory nature of the operation. Very literally discovery is the seeing of things. Likewise, reflection is discovery in that there is abstraction and presentation. Space and time exist for Locke as they had for Newton, they are real and are given in experience. However, while Newton will see them from experiment, Locke attempted the same result with reflection; the former describes the technique of physics, the latter seeks to solve the same problem in terms of the logical structure of ideas.

In the end Locke and Newton may be viewed together in that both have a common problem. In the Newtonian physics the start was made from absolute mass. We have seen how

this gave rise to abstract space and time and relative space and time. In Locke's efforts to fit a theory of knowledge to the relative or noetic aspects of Newton's system he begins not with the absolute but the changing. The problem is to reconcile the two points of approach. It is the beginning in epistemology of the problem of adjusting a relational theory of knowledge to absolute metaphysics.

The emergence of space and time in English philosophy presents most of the problems that were encountered in later treatments as well as the foundation for the formulations of the Kantian philosophy. In the absolutes of Newton and Locke the way was made clear for the absolute idealisms of the early nineteenth century. Given a change in emphasis regarding the function of space and time in physics, they lose their character both as principles of explanation (Galileo) and things to be measured (Newton) and there emerges the notion suggested by Colin Maclaurin that the concept of inertia, for example, implies absolute space and absolute time. The transference of space and time as logically implied to the field of knowledge yields the result that they are necessary categories for knowledge. Although space and time have a logical origin in Newton they are treated as objects of experimental method. Once their logical character was realized attempts at proof, like the pail experiment, seemed futile. For physics there results a partial return to Galileo. For knowledge they are the categories necessary and sufficient to secure the subject matter of perception. When these solutions are combined we have the first post-Kantian idealisms.

The emergence of space and time in England meant the emergence of space and time as things with a double function. As aspects of God they mitigated the severity of the materialistic hypothesis in securing the reality of spirit. For

physics they afforded a background of measurements which through development peculiar to the Platonic empiricism of More, Barrow, and Newton rendered them further subjects for experimental treatment. Locke cannot be said to have cleared up the question of what space and time are except in the sense that his theory of knowledge depends upon an understanding of their relation to ideas. Finally, space and time in England during this period show a peculiar set of relations both to earlier physics and to later theories of knowledge, e.g., those parts of the *Critique of Pure Reason* which attempt to reconcile its theory of knowledge to what were considered valid elements in Newtonian physics.

While it has not been the purpose of this paper to relate the foregoing material to contemporary speculation, it seems important to note that the work of English philosophy today perpetuates an interest in space and time. In Alexander and Whitehead, to mention but two examples, we see reaffirmed the almost national preoccupation with these problems. If it has been possible to throw some light on the antecedents of more modern treatments then it is hoped that part of the way has been made clear for a systematic study of the entire subject.

COLERIDGE

RUDOLF KAGEY

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SAMUEL TAYLOR COLERIDGE has had his share of that genial acclaim produced by Englishmen's tendency to make impetuous statements about other Englishmen. Muirhead has found him "more than any other the founder of nineteenth century idealism"[1] and even John Stuart Mill betrayed himself into ungrudging admiration:

> The name of Coleridge is one of the few English names which are likely to be oftener pronounced and to become symbolic of more important things in proportion as the inward workings of the age manifest themselves more and more in outward fact. Bentham excepted, no Englishman of recent date has left his impress so deeply on the opinions and mental tendencies of those among us who attempt to enlighten their practice by philosophic meditation.[2]

And lest excessive theologizing in his later writings blind the casual reader to Coleridge's acuteness and penetration there is the resonant scorn of Cardinal Newman to whom the poet was a rascal who "indulged a liberty of speculation which no Christian can tolerate and advocated conclusions which were often heathen rather than Christian."[3]

It can be said confidently that Coleridge succeeded during his uneven career in formulating the basic problems of idealism and attacking those problems with an insight and acumen that waited long to be equaled in England. On the difficulties of Locke and Hume he brought to bear a technique

[1] Muirhead, J. H., *Coleridge as Philosopher*, London, 1930, p. 59.
[2] Mill, J. S., *Dissertations and Discussions*, 1859, I, 397.
[3] *Essays*, I, 269.

as productive of results as it was foreign to the English empiric mind. To a nation hostilely suspicious of anything it understood as "intuitionism" he introduced the methods of Kant and Schelling, and when he found over Kant's work a "perpetual and unmoving cloud of darkness," he went ambitiously about dispelling that cloud by employing almost identically the method that his German contemporaries were using to good effect on the Continent.[4]

Idealism in England has manifested five major traits, and though it would be hazardous to say with Muirhead that all or any one stemmed especially from Coleridge, they are to be found deeply and significantly imprinted on his work.

1. First there is a denial of the external-internal disjunction, so fruitful for Locke and so puzzling to Berkeley and Hume. This distinction is denied any save the barest metaphorical meaning and reduced to the proportions of a methodological subject-object relation in which the "external" world becomes the "objective" world, and objective means "systematized." Not until Bosanquet are all the implications of this position carefully traced out, but it is obviously present in the writings of Coleridge. One demand which this reorientation makes is for a new interpretation of "self," and it is in solving this question that Hegel's concrete universal does perhaps its most effective work. As external substance has gradually faded away into functional manifestations of objective variables, so the spiritual substance of Locke and the soul of Berkeley and the mind of Hume, terms always loosely used, become functional manifestations of innumerable *subjective* variables, the self interpreted not as a substance, an entity, but as a *scheme* of constant proportions on

[4] The question of Coleridge's plagiarism and originality has been often hashed over and has for our purposes here but an academic interest. For the latest discussion see E. Winkelmann, *Coleridge und die kantische Philosophie*, Leipzig, 1933, pp. 224 ff.

the basis of which particular desires, feelings, and thoughts are organized.

2. Secondly there appears a new theory of identity, of individuality. This underlies an emphasis on feeling, a discarding of the doctrine of simple association, a denial of the hegemony of external-internal as a metaphysical category, and is answer to the question "What is real?" or more particularly (since experience involves a continual process of spatio-temporal events), "What is the real individual?" British empiricism had taken for granted that the real was atomic, particular, and this whether it were sensation, percept, space, or state of consciousness. With Coleridge the question of particularity, at least in the field of cognition, springs into teasing life, and from the first of the century on British idealism was increasingly plagued with the demand for a definition of individuality. The road to such a definition was seen to lie through the domain of the concrete universal, but so effective was the inertia of tradition that it was not until 1888 that Bosanquet stated an effective solution in idealist terms.

3. The third outstanding trait of British idealism can be discovered in the place assigned to the hitherto minimized or ignored aspects of experience known as enthusiasm, emotion, feeling—the whole brood of non-cognitive categories. Romantic impulse, as it is found from the intricacies of Schelling and Schopenhauer to Lake-Poet ingenuousness, produced essentially an exaggeration of elements which earlier rationalism had been inclined nervously to deplore. In Coleridge this manifests itself in a thoroughgoing voluntarism, and though this particular metaphysic barely outlived its infancy in English thought there seems to be some indication of its revival in the twentieth century. Such a theory makes knowledge more than the function of a specialized faculty and im-

plies that in knowledge the whole man is active. Furthermore it magnifies the weakness of associationist psychology and develops what comes to be known as the principle of redintegration, or the doctrine that psychological recall is a matter not of two particular associated "ideals," but involves rather a whole felt "state" reintroduced by the chance repetition of some one aspect, cognitive, esthetic, conative, of that state.

4. Fourthly there is the continual emphasis on the constitutive nature of thought as opposed to the earlier interpretation of cognitive experience as impressed from without upon a passive mind. In its broader phases this notion is as old as Plato and Aristotle, and it enjoyed almost undisputed hegemony in philosophy for nine centuries after Augustine. But although Bacon, in spite of his better English self, was betrayed into employing it to account for real essences, it was strikingly recessive in British thought from Hobbes on. Not until insular speculation could break free from uncritical allegiance to Locke's "historicall, plain method" did it appear again in the main philosophic stream, this time supported and strengthened by German thinkers and capable of resolving many of the skeptical puzzles that Hume's doctrine of experience had posed.

5. Such an emphasis on the constitutive nature of thought involves a further element of radical importance in adumbrating the relation between logic and metaphysic. The subject-object disjunction, that is, is reduced from a metaphysical tenet descriptive of being to a logical artifice. The dichotomous analysis of experience and thought is discarded for one which Coleridge was fond of calling "trichotomous" and which involves not two final aspects throughout (internal-external, true-false, real-imaginary, positive-negative) but brings all opposites into dialectical harmony, represent-

ing the opposed terms as polar aspects of a wider whole. In Coleridge's lexicon this inclusive whole is the "idea" (the word used in an almost Augustinian sense); in Green it is found to be "consciousness" as the solution at once of "nature" and "self"; and in Bradley it is "immediate experience." Wherever it appears in English idealism it involves as logical base Hegel's concrete universal.

Philosophic continuity is admirably illustrated by Coleridge's intellectual career. The metaphysic which he finally espoused is in the direct line of the Platonic-Augustinian tradition, and the first significant influence on him as a youth seems to have been (strangely enough in eighteenth-century England) that of Plotinos. There is record that as a boy in Christ's Hospital he expounded Plotinism to his comrades and translated a hymn of Synesius. This phase underwent brief eclipse however, for a short time later he was so impressed with the ingenuity of Voltaire's *Philosophical Dictionary* that the masters took him dourly to task for professing atheism. The sanative floggings took effect; thereafter Coleridge was an avowed Christian.

In 1791 he went to Cambridge and possibly came into contact with the Platonic and Neo-Platonic translations of Thomas Taylor which were, despite the hostility they met in academic circles, awakening some of the younger minds to the significance of dialectic. But by 1794 Coleridge was completely under the sway of empiric David Hartley who had done much to further materialism in England by building upon certain "hints" in Newton a theory of vibrations or vibratiuncles residing in the pores of the nerves and causing sensation. Coleridge wrote to Southey that year that he followed Hartley in holding the "corporeality of thought, namely that it is motion." His native bent toward rationalism and mysti-

cism rapidly reasserted itself, however, and although he named his first son David Hartley Coleridge and hoped that the boy would live to become an exponent of the strictest empiricism, he found it intellectually expedient two years later to christen his second son Berkeley Coleridge.

Southey wrote to Coleridge in 1808 that "Hartley was ousted by Berkeley, Berkeley by Spinoza, Spinoza by Plato," and when the third son appeared in 1800 there seem to have been sufficient reasons for not continuing the English tradition in nomenclature, though the boy was not called Benedict or Baruch.

Coleridge's enthusiasm for Spinoza was long-lived and ingenuous. He remarked that Spinoza's idea of God was to him an "Ararat" in the midst of philosophic wastes, and he spoke decisively in 1799 of "my Spinozism." This made for queer intellectual fellowship, however. In a burst of ardor he remarked that "when Christ spoke of his identity with the Father he spoke in a truly pantheistic or Spinozistic sense, according to which he could truly say that his transcendental sense was one with God while his empirical sense retained its finite nature."[5] And he wrote to Humphrey Davy in 1800,

When you have time you would do me a great service if you would briefly state your metaphysical system of impressions, ideas, pleasures, and pains, the laws that govern them, and the reasons which induce you to consider them essentially distinct from each other. My motive for this request is the following:—as soon as I *settle*, I shall read Spinoza and Leibnitz, and I particularly wish to know wherein they agree with, and wherein differ from you.[6]

It was about this time that his association with Wordsworth began to produce philosophic problems and the two of

[5] Crabb-Robinson, *Diary*, I, 307 f.
[6] Letter to Davy, June, 1800.

them studied Spinoza together, with Coleridge trying, he says, to find a scientific basis for Spinoza's monism in the philosophy of association, an attempt he was to discover than which few could be more futile. Throughout his Spinozistic phase, however, he confessed that while his head was with the brilliant Jew his whole heart remained "with Paul and John," and it is probably the lack of an explicitly formulated theory of individuality in the *Ethics* that finally turned him from Spinoza. Crabb-Robinson tells in his diary how Coleridge once kissed the portrait of Spinoza in his copy of the *Ethics* saying, "This book is gospel to me," qualifying the confession a moment later with the breathless *non sequitur*, "His philosophy is fundamentally false." And by 1820 he had so far forsaken Spinoza as to make a long correction in the published volumes of the *Friend* with, he explained, a "two-fold object—to guard my own character from the suspicion of pantheistic opinions, or Spinozism . . . and next, to impress, as far as I could, the conviction that true philosophy, so far from having any tendency to unsettle the *principles* of faith that may and ought to be common to all men, does itself actually require them as its premises."[7]

The immediate spur to Coleridge's search for a metaphysical position more congenial than that of Spinoza was probably Wordsworth and the influence which the poet's romanticism exerted on him. "If I die," he wrote to a friend soon after the experiment of the *Lyrical Ballads*, "and the bookseller will give you anything for my life, be sure to say, 'Wordsworth descended on him like the γόυτῶονθσανει from heaven; by showing him what true poetry was, he made him know that he himself was no poet.' "[8] It is certain that from this time on he allowed his own poetical efforts to lapse more

[7] Letter to Allsop, March, 1820.
[8] Letter to Godwin, March, 1801.

and more, turning with increasing zeal to the problem of establishing a metaphysic which would itself account for the subtleties of poetry. The groundwork for such a metaphysic was laid in 1798 when he spent nine months in Germany with the Wordsworths and returned to England with thirty pounds worth of books on metaphysics to devote the next four years to a study of Kant. At the end of this period the outlines of his own voluntarist system—if system it can be called—were drawn, he had completely forsaken his earlier national necessitarianism, and he had once more attached himself, this time permanently, to the Platonic tradition.

Coleridge himself possessed, what many of his countrymen have not, an acute sense of the importance of metaphysical clarity. It is necessary, he wrote in a memorandum, "in reading a work, especially if critical, controversial, or historical, to notice what the Writer evidently takes for granted throughout, tho' perhaps he has no where expressed it."[9] This appreciation for critical rigor rarely deserted him in what constructive work his facile erratic mind succeeded in doing.

The basic element in Coleridge's own metaphysic is a modification of the fundamental principle which had compelled Plato to write his *Parmenides*, which had supported Augustine's triadic doctrine of God, which had been implied in Spinoza's definition of substance, and which a later British idealist was to employ as irrefragable proof of the absolute. It is expressed by Bradley in the epigrammatic statement, "What is possible and necessary, that must be real," and is in all its forms a variation of the ontological proof. Coleridge puts this belief in the form of an assertion that whatever is

[9] Quoted by Alice D. Snyder in *Coleridge on Logic and Learning*, New Haven, 1929, p. 138. Miss Snyder's book contains valuable selections from the as yet unpublished manuscripts.

necessary to the possibility of a given reality must itself be real. His proof, progressing by means of an ethical concept to a monistic interpretation of reality can be equally well stated from the point of view of idealist logic. Bradley made both analyses, the ethical first in his *Ethical Studies,* the logical in *Appearance and Reality.* Briefly the formulation on either basis involves a recognition of the inadequacy of complete particularism either with respect to motive or to predication. For the particular to be meaningful there must be a ground in the light of which it appears, a system which defines it as singular whose proportions are truly universal. In ethics this whole is the good will as *Ding an sich,* or, as Coleridge would have it, as the "idea" of the man; in logic it is the thoroughly articulated ground which validates an assertion, ultimately (all indealists insist on this) involving the whole of knowledge.

Central also to Coleridge's metaphysic and indispensable to an understanding of the monistic proof is his use of the word idea. He early broke away from the empiricism of Hartley and, unlike most of his British predecessors, forsook the word as denoting a psychological event. This freed Coleridge from many of the shibboleths which had stalked through British empiricism and finally found an impregnable lair in the phrase "state of consciousness" which Spencer was to employ with consummate confusion. Coleridge defines idea in his *Logic* as meaning "those truths namely (supposing such to exist) the knowledge and acknowledgment of which require the whole man, the free will, no less than the intellect, and which are not therefore merely speculative, nor yet, merely practical, but both in one."[10] It would be difficult to find a statement more at variance with the traditional British technique in philosophy and one more pregnant with im-

[10] Snyder, *op. cit.,* pp. 100 f.

plications of the future of English thought. Coleridge distinguishes between generalizations, abstractions, and ideas, criticizing Kant as he does so. The idea is equally opposed to both generalization and abstraction, for it must be conceived as anterior to "all images and as that which is presupposed in all form, and in every concrete as far as the same is reducible to any determinate law."[11] The idea is

> incapable of being abstracted or generalized from any number of phenomena, because it is itself presupposed in each and all as their common ground and condition. . . . It is attributed, never derived.[12]

And he speaks of "Ideas of being, form, life, the reason, . . . laws of conscience, freedom, immortality, God."[13] He is clearly sensible of the difficulty of making such a position plain. "An Idea in the highest sense of that word cannot be conveyed but by a symbol; and, except in geometry, all symbols of necessity involve an apparent contradiction."[14]

The idea he says was effectively understood by the schoolmen who placed its origin in reason, its ground in conscience, and its confirmation in the visible world. It is at once the apprehension of the world as logical and as emotionally moving: the idea involves both cognitive recognition of relations and structure, and at the same time an impulsive act of faith. As such it can be neither barren nor irrational inasmuch as both logical analysis and passionate affirmation are requisite to its being. It cannot be the result of an empirical process for it is presupposed in the very process as ground of observation. In this hint Coleridge anticipates T. H. Green's major criticism of the empiric tradition, a criticism which sees in purely empiric technique a formless procedure which

[11] *Ibid.*, p. 82.
[12] *Friend*, 1818 ed., 310 n.
[13] *Ibid.*, p. 63.
[14] *Biographia Literaria*, Shawcross ed., Oxford, 1907, I, 100.

could be at best merely argument from enumeratio simplex. The idea is, as Coleridge sees it, logical, ethical, and natural, born from reason, grounded in the categorical imperative, and confirmed by the development of objective events—at once the manifestation of man as knowledge, will, and perception, a synthesis of what the empiric tradition had kept in sterile isolation, the corner stone of a philosophy of worth as well as of fact.

The source of the idea Coleridge ultimately found in imagination, his use of that word being unique. But until this concept had been framed he employed a variant of the less enigmatic Kantian explanation.[15] The idea is the product of the light of reason—a phrase used in a sense more congenial to Anselm than to Locke—and is inevitably of universal application, to logic, to ethics, to poetry. The idea is the essence of a man or a thing, but the essence discovered by amplifying the particular into all its implications rather than by fining it down by attrition to its quiddity. Ideas are to be distinguished from not only images and isolated concepts but even systematized conceptions in the form of theory. As such, the product of thought must be ever at the mercy of new data, liable to continual upset or modification as refined observation yields incompatible facts. It is only as the theories of science approach absolute rationality, dropping sensory images and perceptual technique for the methods of mathematics, that they approach the idea, it being distinguished before all else as the positive synthesis of particular and universal.

The idea thus established as a functional moment in an experience of universal proportions was, furthermore, not to be dealt with by means of the older dichotomous tools. Locke had been satisfied with a distinction between material

[15] Cf. Snyder, *op. cit.*, p. 135.

substance and spiritual substance, Berkeley with finite idea and infinite mind of God; Mill later saw in the simple diversity of fact and fancy an ultimate trait of nature; but Coleridge points out that to rely on the principle of dichotomy is to leave philosophy with "what is more truly eristic than logic." To adopt a stand which depends on the sole and final opposition of certain categories involves delusion. For one thing it makes truth an adventitious matter save in strictly deductive sciences, and even mathematics was inductively interpreted by the most rigid empirics. And for another thing it leads, Coleridge notes in a passage the logic of which is not wholly clear, "to Pantheism under one or another of its modes." But there was sounder ground than this upon which to base his "trichotomy." In the "Sixth Remark" at the conclusion of what remains of his *Logic,* he writes that in Kant's tables there are

> the same number of species, three to wit, under each of four heads, whereas in the common or canonical Logic, that is, in all classifications *a priori* by means of concepts, the form of dichotomy obtains. But in addition to this remark we have now to observe another not less noticeable circumstance, viz. that the third category arises in all cases out of the conjunction of the first and the second of the same genus.[16]

Muirhead asserts confidently that "it was late in life and only to a small extent that he became acquainted with Hegel's contemporaneous attempt to revolutionize logic precisely on this basis," and sees here "the first real attempt of an English philosopher to grapple with the difficulties of the Hegelian dialectic."[17] At any rate, such an analysis issuing from an English thinker in the second decade of the nineteenth century is a notable event.

In the earliest sketch of his philosophy published in the

[16] Snyder, *op. cit.,* p. 103.
[17] Muirhead, *op. cit.,* p. 87.

Friend in 1818, Coleridge notes the Kantian distinction between reason and understanding and suggests that the law of trichotomy is the logical statement of the principle of polarity "or essential dualism," this latter being defined as a principle that "every power in nature and in spirit must evolve an opposite as the sole means and condition of its manifestation; and all opposition is a tendency to re-union."[18]

What really counted for Coleridge in all reasoning processes were not "conceptions" whether inductively arrived at or not, nor chains of syllogistic argument, product of the "understanding,"[19] but the fundamental apprehension of reality with which the scientist or the layman *begins,* the unity which alone makes possible later bifurcations and analyses, and which must underlie all these divisions and cleavages throughout the whole inferential process—what really counted for Coleridge was the idea. That reason was for him in the end not an isolate faculty he makes abundantly clear in spite of the occasional obscurity of his expression.

> What is it I employ my metaphysics on? To perplex our clearest notions and living moral instincts? . . . No, to expose the folly and legerdemain of those who have . . . abused the blessed organ of language, to support, to kindle, to project, to make the reason spread light over our feelings, to make our feelings diffuse vital warmth throughout our reason—these are my objects and these my subjects.[20]

Muirhead suggests that Coleridge's own metaphysical efforts may be characterized (appropriately enough for a countryman of Berkeley and Hume) as an attempt to carry

[18] *Friend,* 1837 ed., I, 121 n.

[19] For a lively and scholarly analysis of Coleridge's confused use of "reason" and "understanding," see René Wellek, *Immanuel Kant in England,* Princeton, 1931, pp. 125 ff. Mr. Wellek's article is by far the best technical discussion of Coleridge's philosophy that has appeared.

[20] *Anima Poetae,* 42.

the technique of Kant another step and turn the results of the *Critique* against its very author.

Central to his whole philosophic thought then was the formulation of a new theory of identity, a theory which would maintain what was valuable in the older analysis and yet make room for the elements he felt were needed. He made, indeed, great strides toward this goal. "Terms that can be rightly opposed to each other in the evolution of a truth," he wrote, "must be identical in the root, that is, radically one."[21] And one of his favorite maxims was *opposita semper unigena*. Long before the problem engaged the attention of other English thinkers Coleridge undertook to analyze the question of negation, pointing out as had Erigena and Spinoza before him, that no significant negation can be bare negation, but must always involve a positive ascription of some real quality which substantiates the negation. A true individual, Coleridge maintained, is not simply an atom, but rather a unit capable, he quaintly put it, of manifesting its centrality in various points at a distance. What are the conditions, he asks, under which this apparently anomalous situation can arise? They are three. (1) First, the unit must be a component of a system, the relations which constitute that system focusing themselves in a point not necessarily the unit chosen. (2) Secondly, it must be capable of interpretation as itself the center of a system. (3) Thirdly, it must be capable of being, *for itself*, in so far as it is self-existent, the center of the entire universe, "in a perpetual tendency to include whatever else exists relatively to it in itself, and what it cannot include, to repel."[22]

This results, he feels, in a monadic interpretation of the cosmos along Leibnitzian lines, and after having developed some of the implications of that interpretation, he concludes,

[21] Snyder, *op. cit.*, p. 100.
[22] Quoted by Muirhead, *op. cit.*, p. 123.

In this, the only scientific view, Nature itself is assumed as the Universal Principle of Life, and like all other *Powers,* is contemplated under the two primary Ideas of Identity and Multeity, i.e. alternately as one and as many. In other words, exclusively of *degree,* and as subsisting in a series of different intensities.[23]

Coleridge finds nature in all levels tending toward such an individual but reaching it only in man. Individuality in nature is not to be found in the atomicity of a particular, but rather in the capacity of that particular to transcend its atomic limits, to reach out and to assimilate, either logically or ethically, other elements lying beyond it, and thus to manifest itself as an aspect of a whole structure, while at the same time it is capable of rounding itself off into a self-substantiating entity within the larger sphere.

As critic of empiricism Coleridge also had much to say on the subject of that cardinal tenet of the empirics, the doctrine of association. Having denied that thought is atomic, that ideas are particular discrete entities, it is obvious that he would have no room in his own system for such a theory.

I almost think that ideas never recall ideas [he writes in a letter to Southey] . . . any more than leaves in a forest create each other's motion. The breeze it is runs thro' them—it is the soul of state of feeling.[24]

Although Coleridge's presentation of the doctrine is crude it contains in germ just what later idealists were to make most of. Redintegration, that is, is not confined to perceptions and "ideas," and thus does not exclude those more subtle successions and structures that have predominantly emotive and directive significance. In Bradley's phraseology, redintegration is nothing less than the association of universals, and if particular psychologic fact appears to be reinstated on occa-

[23] *Loc. cit.*
[24] Aug. 7, 1803.

sion this is because the particular was one truncated aspect of a wider whole, of a universal which has as its dimensions thought, will, and feeling. The element of greatest importance in Coleridge's analysis is *context:* the singular *thought* qua singular is meaningless, for it has meaning only as determined by the context in which it occurs, and as such its singularity is universal, being an aspect of a total situation of which will and feeling are integral phases.

Coleridge's most pertinent criticism of the empiric philosophy, however, was at the same time his simplest. He was converted, we have seen, in a very short time from the doctrines of empiricism which he himself espoused as a young man. In a letter of March 16, 1801, he writes that after a period of most intense study, unless he is mistaken he has "not only completely extricated the notions of time and space but overthrown the doctrine of association as taught by Hartley, and with it all the irreligious metaphysics of modern infidels—especially the doctrine of necessity." A few days later he feels that he has solved the whole difficulty of what he calls the Newtonian philosophy, or what we might better know as the philosophy of Locke. The main fallacy of such a metaphysic, he maintains, is that it considers the mind, the subject, as only

> a lazy looker-on in an external world. . . . If the mind be not passive, if it be indeed made in God's image, the Image of the Creator, there is ground for the suspicion that any system built on the passiveness of mind must be false as a system.[25]

If then thought is constitutive, if the mind is active in the knowledge process, a theory of universals far different from that of Locke or Mill will evolve in Coleridge's thought. Working from the basic assumptions of Kant he comes to

[25] Letter to Poole, March 16, 1801.

the conclusion that the universal is not at all that product of paring down and elimination which the empirics were wont to make it. Indeed universality will be arrived at much in the same way as individuality, by an expansion, an amplification of particularity to present the particular as itself but manifesting a centrality determined by a systematic whole of which it is an element. This is, briefly, the theory of the concrete universal developed by Hegel and later incorporated in British thought by Green. Hegel's own conception of the "notion" illustrates what Coleridge was working toward. The chief point here of course is the solution in *ground* of the dichotomy which always separated universal and particular in empiricist logic. The identity of a proposition consists not in the atomicity of its terms, but rather in its individuality, which is the ground on the basis of which the proposition is made, and determines, as Hegel expresses it, the self-relation of the proposition, involving, that is, its other. Identity then is meaningful only in the light of diversity. T. H. Green is the first English thinker to come to a definite formulation of this doctrine in British terms.[26]

Instead of individuality meaning *isolation from* others, as it had in the empiric tradition generally, individuality comes to be defined by *relation to* others, with the consequent breaking down of the hard and fast distinction between identity and diversity. There is the one especial advantage of this way of thought that it makes possible a logical analysis of change far more fertile than the Humian technique which reduced change to succession of mere diversities and cut logic off at once, as Mill and Spencer were later to find to their discomfiture, from a true grasp of organic phenomena. The concrete universal furnishes at once a *point d'appui* for the analysis of the particular in its character as particu-

[26] Cf. especially *Works*, 1886, II, 189.

lar, and a method of interpreting that particular as one aspect in a continuously changing unity. It is by means of the concrete universal that English idealism succeeds in formulating the notion of a substantial identity, not an abstract identity, an identity which can persist through difference, and, indeed, can be realized only in difference. This was the goal of Coleridge's metaphysic, and if he himself never succeeded in reaching it in fact, he indicated the way so clearly that, had he had a successor capable of understanding him, and gifted with his own penetrating insight, the doctrine might have been profitably assimilated into the main current of British idealism long before it actually was.

"The grand problem," Coleridge writes, "the solution of which forms . . . the final object and distinctive character of philosophy, is this: for all that exists conditionally (that is, the existence of which is inconceivable except under the conditions of its dependency on some other as its antecedent) to find a ground that is unconditioned and absolute, and thereby reduce the aggregate of human knowledge to a system."[27]

Whatever changes occurred in Coleridge's philosophy, from first to last there was this one impelling direction to his thought, the necessity of reaching a view of things which could reconcile the diversities emphasized by science and common sense with the unity demanded by faith, feeling, and ultimate metaphysical premises. Conscious at least of the need for a fertile theory of unity and identity, he came nearer to filling that need than any of his empiric countrymen who ignored it.

Not content with denying the passivity of the subject in

[27] *Works*, 1853 ed., II, 420.

the first moment of the knowledge process and giving a Kantian twist to his theory of spatial and temporal phenomena, Coleridge went even further in his epistemology and suggested that sensation itself was a phenomenon demanding the active connivance of mind.[28] Sensation, that is, not only does not present us with an object ready-made, but is itself merely the neutral boundary between subject and object partaking of traits of both those spheres. Universality is thus one of the characteristics of even the lowest phase of the knowledge process. Early in his intellectual career he wrote metaphorically, "The dim intelligence sees an absolute oneness, the perfectly clear intellect knowingly perceives it, distinction and plurality lie between."[29] At this time he was, as the passage indicates, somewhat under the influence of the spirit if not the letter of Leibnitz, but the elements of his struggle toward the concrete universal and away from empiricism are actively present.

"Does nature . . . ," he asks in his *Logic,* "present objects to us without exciting any act on our part?" And after a brief discussion he comes to the conclusion that the sciences of "Hydrostatics, Aenology, Crystallology and Chemistry," all unified by a comprehension of pure mathematics, may be required before a legitimate judgment can be passed on a single phenomenon, or, as he pregnantly expresses it, "before the image can be safely declared to possess objective reality."[30] Reality is no longer mere externality, but is rather objectivity, system, organization, and it has already been noted that, in his discussion of the idea, Coleridge contrasts the "idea" not with the real, but with the phenomenal.

[28] See the quotation in Muirhead, *op. cit.,* p. 71.
[29] *Anima Poetae.* This in 1800.
[30] Snyder, *op. cit.,* pp. 116 f.

This insistence on *ground* as the distinguishing element in determining the reality of experienced phenomena he carries with him even into his treatment of esthetics, where, discussing the function of poetry, he says, "Nothing can permanently please which does not contain in itself the reason why it is so and not otherwise,"[31] a point of view which gives rise later to Bradley's contention that the validity of a judgment depends on the expression *in* the judgment of the conditions which constitute its ground.

Just as the distinction between subject and object was not for Coleridge a final metaphysical dichotomy, so is the distinction between thought and thing, between intellect and nature, resolved into a dialectic whole.

> Thinking [he says picturesquely] can go but *half*-way. . . . To know the *whole* truth we must likewise Act: and he alone acts, who *makes*—and this can no man do, estranged from Nature. Learn to know thyself in Nature, that thou mayest understand Nature in thyself.[32]

This gives a key to his theory of knowledge, a theory with its roots deep in the Augustinian tradition. The knowledge of the *conditions* of knowledge as those conditions are manifested in the knowing subject, in the mind, is the "weightiest and worthiest of all contemplations." Only in a thorough apprehension of the aspects of the intellectual act itself, he asserts, echoing Anselm, can "the substance and life of all our knowledge and the ground of intelligibility of all other objects of knowledge" be found. And he remarks that all knowledge which has any claim to liberality and enlightenment is a form and means of self-knowledge, "whether it be grammar or geometry, logical or classical." The reason for this is that knowledge in order to be significant, must be organized, systematized, and that the laws of that organization

[31] *Biographia Literaria*, Chap. XIV.
[32] Quoted in *Blackwood's Magazine*, Oct., 1821.

can be found only in the constitution of the mind, not discovered after the fact in the sole object.

This is, however, a step beyond the Kantianism it appears to be on the surface. It has an affinity with Fichte, and even more with Hegel, but the essential thing to be noted is that the proposition is identical with its converse. Although Coleridge was prevented by his bias from making the point, it is obvious that in his thought the two propositions—knowledge of objectivity proceeds through knowledge of self, and knowledge of self proceeds through knowledge of objectivity—are but two aspects of one and the same thing. For what is the self, knowledge of which is the model of all knowledge? The true recognition of the meaning of self comes only, Coleridge asserts emphatically, when we "have learned the possibility of finding a Self in another (yea, even in an enemy)."[33] It is in this essentially ethical notion that his doctrine of individuality and identity can be most pertinently felt. Individuality he had characterized as the capacity of a unit to manifest its centrality "at a distance." Thus the truly individual self is the self which finds its objectivity in centers at a distance, in other selves, in other things. The self, that is, is manifested as idea, as that which brings into unity the infinite variety of experience, expressing its selfhood not in an abstract identical atomicity, but in the particulars of objective fact (including among these the objectified particulars of introspection). Abstract uniqueness is not only unessential to the conception of self, but it is not the most primitive, for, Coleridge points out, in early childhood the mother or nurse can legitimately be said to be the self of the child, and "who has not experienced in dreams the attachment of our personal identity to forms the most remote from our own?"[34]

[33] Quoted by Muirhead, *op. cit.*, p. 144.
[34] Cf. Muirhead, *op. cit.*, p. 143.

In his commonplace book there is presented the argument (1) that consciousness, to be significant, must be *self*-consciousness, *i.e.*, must be the consciousness of a unity of which self is the unifying principle; (2) that self-consciousness, on the other hand, must always demand a consciousness of other, *i.e.*, an objectifying of the self known; (3) that in thus distinguishing between self and not-self we necessarily unite them in some ground basic to their division; (4) that the consciousness of conscience—the operation of the categorical imperative—can be interpreted as an "act, namely, in which and by which we take upon ourselves an allegiance and consequently the obligation of Fealty," fidelity, that is, to the objectification of order which a world containing such unities and such acts manifests.

It goes without saying then that a strict naturalism in the sense in which "nature" was currently used in France would have been repugnant to Coleridge; "even the philosophy of nature," he remarks, anticipating Green, "can remain philosophy only by rising above nature."[35] When he uses the word it is often in the Stoic sense. Nature is the objectification of reason, the dynamic ground of all predication and all ethical decision. He gives, to illustrate the syllogism, the quaint example, "There is an individual man, John Woolman by name; he followed nature in all his actions; all men who do this we arrange under one Class and call them virtuous; John Woolman therefore is virtuous."[36]

Judgment Coleridge defined as "the power of determining this or that under the condition of some rule," and stated that it is the "reason," as constitutive of an ordered objective world, which gives necessity or universality to the

[35] Muirhead, *op. cit.*, p. 277.
[36] Snyder, *op. cit.*, p. 142.

determinations expressed in the judgment.[37] In relation to the logical process the reason is

> the source of Principles, the Understanding is the faculty of Rules. The Reason is all *end,* summa finium, the Understanding all *means,* summa mediorum.[38]

The employment of the understanding alone can yield at best but a high sort of lexicography, and at worst is only a kind of index-making. With this Coleridge contrasted what he knew as dialectic, the use of the understanding to word truths known in a higher light, known, indeed, as ideas.

This distinction, familiar in Kant, seems to have antedated, in Coleridge's own case, his acquaintance with Kant. He says he found it in Plato, Shakespeare, Milton, Bacon, and the Cambridge Platonists, under various forms but always involving a contrast between *discursive* reason and *unitary* reason. The unitary reason it was which produced the idea, the whole-view which could then be broken up, analyzed, and its parts evaluated in relation to one another. This latter step, exercise of what Coleridge calls "understanding," had ever been the way of British empiricism. He is tireless in emphasizing the necessity everywhere for the a priori idea which alone can, as ground, make the resultant process significant. But whether he took the distinction from Kant directly or not, it is certain that Kant did much to strengthen and structuralize it. "The writings of Kant," he says, "more than any other work, at once invigorated and disciplined my understanding," and Kant's *Critique* it was which turned his attention from the empiricists to more fundamental issues, just as later it was the *Critique* that operated on British idealism as a whole, through the interpretation of Green, to give the national mind a new inclina-

[37] Cf. Snyder, *op. cit.,* p. 84.
[38] *Ibid.,* p. 110.

tion. By 1822 when he had completed the first draft of his *Logic* he seems to have been familiar with nearly all of Kant, being not the first Englishman to read the Königsberg philosopher, but certainly one of the first to attempt to master him.[39]

Coleridge's dynamic metaphysic underlies his reading of Kant throughout, and is clearly implied in his assertion that Kant's table of categories is superior to the predicables of Aristotle, inasmuch as that of Kant has a guiding principle in its development, this principle being evolved from an analysis of the understanding, while Aristotle had none. If Kant's influence on his logic and metaphysic was profound, it was doubly so in the field of morals. Coleridge's freedom from the shackles of immediate tradition is nowhere more clearly illustrated than in his discussion of ethics as a science. The concrete universal in the power of which, if not in the light of which, he formulated his thought, stands him in good stead when he approaches questions of the "good" and "freedom."

> Ethics, or the Science of Morality, does indeed in nowise exclude the consideration of Action; but it contemplates the same in its originating spiritual Source without reference to Space or Time or Sensible Existence. Whatever springs out of "the perfect *Law* of Freedom," which exists only by its unity with the Will of God . . . that (according to the principles of Moral Science) is *Good*.[40]

When "Will of God" is read in its sense of the dynamic aspect of universal reason manifested to knowledge in the idea, it will be seen to follow clearly that no true theory of morals can be based on mere generalizations from sense experience. The ethics of Hume or Mill or Spencer would no

[39] Cf. René Wellek, *Immanuel Kant in England*, 1931, Chap. I.
[40] *Aids in Reflection*, London, 1913, p. 197.

more be a science from Coleridge's standpoint than would random observations constitute the sciences of physics or chemistry. Valuable as such observations may be in determining the spatio-temporal course of action to be followed, they are themselves not productive of, but ultimately derivative from, a body of a priori truth constitutive of the idea. It was not until 1876, more than half a century later, that English philosophy produced in Bradley's *Ethical Studies* anything as stimulating as Coleridge's hints. The long hiatus between Coleridge and Bradley was partially bridged by Green's *Prolegomena,* but for the most part the notion of the concrete universal and the new formulation of the law of identity were so alien to the spirit of empiricism that they lay discarded and ignored by thinkers like Mill and Spencer.

Coleridge distinguishes *logic* from *noetic* and may have planned to follow his two-volume *Logic* with a further work of broader proportions. Logic in his terms is the science of knowledge, or *logos,* in which is everything relative to the distinction between subject and object, and the relations among objects. Noetic, on the other hand, refers to that which is absolute and non-relational because itself the ground of all relations, in short the realm of the idea. Between the two there is the place of mathematics as connected on the one side with sensory intuition, and derived, on the other, from self-substantiated principles. Logic makes its assumptions just as do the other sciences, its chief presupposition being the absolute division of subject from object and objects from one another, although as logic it never raises the question of the final validity of such distinctions, which are seen from the wider viewpoint of noetic to be but aspects of the concrete whole, the self, unity. Logic, he suggests in a letter, may

possibly be conceived as an organic science concerned with words and relations not as dead things, static entities, but rather as "parts and germinations of the plant." "In something of this order I would endeavour to destroy the antithesis of *Words* and *Things,* elevating, as it were, Words into Things, and living things, too."[41]

This brought about, of course, a critical attack on the theory of syllogism. He labels the three steps, "clusion," "inclusion," and "conclusion," and says, in a passage that sounds strangely like Mill,

In some part or other of every Syllogism we declare or imply the Character of the Class, we assume that the Individual belongs to this class, and we conclude therefore that the Individual must have this Character. . . . But is not this merely repeating the same thing in other words? Some have thought so, and in consequence have asserted that all reasoning is made up of Identical Propositions. . . . [But] in every Syllogism I do in reality repeat the same thing in other words, yet at the same time I do something more; I recall to my memory a multitude of other facts and with them the important remembrance that they have all one or more property in common.[42]

That Coleridge's *Logic* was far from its completed form is indicated by this championing of an empiric stand radically at variance with his main metaphysical position. Elsewhere he points out acutely that the syllogism was never meant as and could never be a primary and direct instrument of discovering truth, nor can it serve otherwise than as an abstract formula to distinguish truth from error. By itself the science of the syllogism is a hollow science, a thousand syllogisms amounting to no more than "nine hundred and ninety-nine illustrations of what a syllogism is."[43]

[41] Letter to Godwin, Sept., 1800.
[42] Muirhead, *op. cit.,* p. 63.
[43] Snyder, *op. cit.,* p. 81.

Truth, significantly considered, is rather a function of the whole subject of discourse—which is never comprised in the nominal subject of judgment—the ground of predication which runs through the syllogism as it does through all reasoning and inference.[44] Thus with mathematical truth. "Points, lines, surfaces," Coleridge asserts, joining issue with Mill's school, "are not bodies but acts of the mind, the offspring of intellectual motions, having their canons in the imagination of the geometrician."[45] As *acts* of the mind they are at once both substantial and dynamic, and since their canons lie in the imagination of the geometrician they are manifestations of the idea. What, though, of the reality of such geometrical entities? Coleridge is perfectly clear on this point. Reality is for him objectivity, not externality. Mill's geometrical lines and figures will always be *unreal* because mental, but for Coleridge "If . . . we use the term *real* in opposition to fantastic, or if we use *objective* as the contrary of accidental in order to distinguish from the results of individual particulars then space is in this sense an undoubted reality, and eminently objective, but if we take the word *real* in opposition to mental; or *ob*jective in opposition to *sub*jective in its wider sense, then we must reverse the position."[46] The real is the objective, the ordered, the implicative basis of inference, and this whether it be mental or material, spiritual or physical, internal or external.

[44] "The logical criterion of truth or the harmony of an affirmation with the laws of reason and the rules of the understanding, is the conditio sine qua non but still only the negative condition of all truths, and farther than this pure and proper logic cannot extend, and consequently can supply no touchstone of error or falsehood, when such error lies in the thing, fact, or reality considered as the substance and matter of the thought" (Snyder, *op. cit.*, p. 87). The "thing . . . as the substance and matter of the thought" is obviously the concrete universal disguised.

[45] Muirhead, *op. cit.*, p. 67.

[46] Snyder, *op. cit.*, p. 121.

As might be expected, Coleridge's theory of meaning, based on such a view of reality, showed the way at least to a distinctively advanced interpretation. Berkeley's doctrine of signs had indicated already that a truly fruitful theory of meaning would be one which found meaning to be a functional aspect of propositions themselves rather than a vague correlation between word and thought or thought and thing, and Coleridge expands this original hint to include the subtle phases of emotional values which had always been stepchildren in the home of empiric tradition. In his *Logic* and again in *Biographia Literaria* he suggests the possibility of considering words as "living growths," seeing in them "affects and organs of the human soul," not dead entities but living beings, conditioned by the soil of context. The main emphasis here has already been suggested in his assertion that the "main object of logical investigation is *most often the establishment of the object, itself, which, once established, contains, or rather is coincident with its inferences.*"[47] An object which contains or is coincident with "its inferences" is obviously more than the simple object which British empiricism had been concerned with. It is at once itself *and* the system in which it operates; its "meaning" does not lie extrinsic to it, but is the very ground out of which the object is developed, and as such there is no rupture of continuity between the particularity of the object and the universality of its meaning. The meaning is thus not an abstract universal, working isolated and loose from the object, but is rather the concrete universal which *is* the total object. In a MS fragment Coleridge indicates his awareness of just this problem.

In all Discourse and Intercourse of Mankind [he writes quoting Jeremy Taylor] . . . by *Words,* we must agree con-

[47] Muirhead, *op. cit.,* p. 71.

cerning each others' Meaning: and how is this possible unless we first determine, each of us what he himself means by them? And how, again, is this to [be] expected where the Individual has never been taught or accustomed to put the question at all? Or, worse still, (tho' one of the most common and approved Recipes for Self-education in modern times!) to find out the *explanation* in an English Dictionary, i.e., one or more other words—a scheme of conveying the *meaning* of each term, that might perhaps have answered at the Tower of Babel during the interval between the confusion of Tongues and the Dispersion of the Speakers, but which in any cultivated Language can answer no other end but that of passing off dim, vague, or confused . . . [the manuscript breaks off here].[48]

The point is that meaning is not atomic, that there is not "one meaning to one word or one object," but that meaning is always determined by a complex of factors, immediate context, purpose, special assumptions, emotive aura, etc. Nor was Coleridge insensible to the more perplexing aspects of the question. Working toward a theory of literary criticism as he did in the *Biographia* he was impressed with the fact that meaning is never compressed wholly into discursive terms. In the essay *On The Principles of Genial Criticism,* he puts into the mouth of Milton a definition of beauty which combines Kantian and Plotinian emphases:

The Beautiful arises from the perceived harmony of an object, whether sight or sound, with the inborn and constitutive rules of the judgment and imagination: and it is always intuitive. As light to the eye, even such is beauty to the mind, which cannot but have complacency in whatever is perceived as pre-configured to its living faculties.[49]

And in the essay *On Poesy or Art,* which has been seen by some critics as for the most part a transcript from Schelling,

[48] Snyder, *op. cit.,* p. 77.
[49] *On the Principles of Genial Criticism,* Shawcross ed. of *Biographia Literaria,* II, 243.

Coleridge writes, "... whilst it recalls the sights and sounds that had accompanied the occasions of the original passions, poetry impregnates them with an interest not their own by means of the passions, and yet tempers the passion by the calming power which all distinct images exert on the human soul."[50]

Whether this particular critical tenet be borrowed from Schelling or not, it is one the essence of which is peculiar to Coleridge, appearing again and again in his work. In a letter to Humphrey Davy he writes, in the lyric hyperbole of his correspondence style, that he looks every morning in the *Morning Post Gazetteer* for an advertisement of "Mr. Davy's Galvanic Habitudes of Charcoal." "Upon my soul, I believe there is not a letter in those words round which a world of imagery does not circumvolve; your room, the garden, the cold bath, the moonlight rocks, Barristed, Moore, and simple-looking Frere, and dreams of wonderful things attached to your name."[51] No doctrine of association, no atomic theory of meaning, could possibly account for such a complex phenomenon. It is not to be wondered at that a man capable of expressing the phenomenon thus pointedly should have sought for a theory of meaning flexible and inclusive enough to describe it. A few months later he writes that his immediate ambition is to "concentre my free mind to the affinities of feelings with words and ideas under the title of *Concerning Poetry.*"[52] And that he recognized the great value of Berkeley's doctrine of signs, as opposed to the oversimplified theories of the Bishop's predecessors and successors, is made clear in a passage in the *Logic* where he remarks that Hume's work in general is an illustration of

the many and important advantages which truth and science

[50] *Ibid.*, II, 254.
[51] Letters, Oct., 1800.
[52] Letter to Davy, Feb., 1801.

derive from strict consequence even in dangerous error. . . . Berkeley's remark that we ought to speak of signals not of causes is the essence of Hume's doctrine, which was a spark that cannot be said to have fallen on incombustible materials. It produces great heat and volumes of smoke, but kindled . . . little light.[53]

That the light should have been so faint was owing, of course, to the skeptic metaphysic which supported Hume's logic and epistemology. That, modified into the conception of ground and consequent, it was destined to illuminate much obscurity in his own work, Coleridge was confident.

Historically it is relatively unimportant to attempt a separation of what was unique in his thought and what was borrowed from German sources. The important thing is that Coleridge was the first of the English line to see the overwhelming significance of the relation of ground and consequent, of which cause and effect becomes but an aspect; to seek a satisfactory definition of the individual and interpretation of identity; and to make use of a universal of concrete rather than abstract character. In turning to German rather than French sources, he gives the first hint of what was to become a significant trait of British philosophy a half century later.

[53] Muirhead, *op. cit.*, p. 79.

HEGEL AND MARX

SIDNEY HOOK

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"HEGEL's dialectic is the fundamental principle of all dialectic only after its mystical form has been sloughed off. And that is precisely what distinguishes my method."—Marx to Kugelmann.

No two names are at once so suggestive of both agreement and opposition as are the names of Hegel and Marx. To conjoin them is not so much to express a relationship as to raise a problem—one of the most challenging problems in the history of thought. How did there develop from what was ostensibly the most conservative system of philosophy in the Western-European tradition, the revolutionary ideology of the greatest mass movement since Christianity? This is a theme of more than theoretical significance. Professional historians of philosophy—when they have not ignored it—have been puzzled by it. They can see a historical sequence between Hegel and Marx but not a logical connection.[1] Some have even gone so far as to deny any actual influence of Hegel upon Marx save a *psychological* one.[2] On this view the Hegelian terminology with which all of the classic Marxian literature is shot through is regarded as a curious verbal

[1] For example, the last edition of Ueberweg's *Grundriss der Geschichte der Philosophie* (1923), reputed to be the standard of philosophical objectivity, in its brief notice of Marx mentions the fact that Hegel influenced him. But it then goes on to add, "In opposition to idealism Marx possessed an extraordinarily keen eye for the lower instincts of man. In fact, they were the only ones that existed for him" (IV, 227).

[2] Cf. Croce, B., *Historical Materialism and the Economics of Karl Marx*, English trans., New York, 1914, p. 82.

fixation. Even some of Marx's disciples have discreetly sought to suppress the traces of his Hegelian origin, for fear that they might suggest speculative excesses.

These interpretations, however, cannot explain the *persistence* not merely of Hegelian terminology but of basic Hegelian categories in the Marxian philosophy. This combined with the common opposition of Hegel and Marx to all varieties of Kantianism on the one hand, and atomistic positivism on the other, suggests more than an extrinsic connection. And when we add the acrimonious and almost unanimous rejection of the dialectic method by all critics of the Marxian philosophy,[3] we have reason to believe that the Hegelian elements in Marx are integral to his system. Nor could it have been merely philosophical piety which led men like Lenin to turn aside from the exigencies of revolutionary civil war and advise fellow Marxists to constitute themselves into a "society of materialistic friends of the Hegelian dialectic."[4]

No one can plausibly call into question the historical influence of Hegel upon the formation of Marx's thought. That has been amply documented by Marx himself in published and unpublished writings. The difficulty has been to evaluate that influence; especially since Marx subjected the Hegelian philosophy itself to keen criticism in his analysis of the left-

[3] I except here the criticisms of Marx made by avowed Neo-Hegelians like Plenge, Hammacher, Croce and others. All others are quite unceremonious in their characterization of the dialectic method. E.g., Masaryk, T., *Die philosophischen und soziologischen Grundlagen des Marxismus,* 1893, p. 45, confesses that the Hegelian dialectic even in its materialistic form appears to him to be the veriest hocus-pocus. Bernstein, it will be remembered, was particularly bitter about *die Fallstricke* of the Hegelian dialectic method which "prevented all consistent analysis of things." *Die Voraussetzungen des Sozialismus,* . . . 3d ed., 1923, p. 59.

[4] *Unter dem Banner des Marxismus,* German ed., 1925, p. 7, translated from the Russian edition of 1922.

Hegelianism of B. Bauer and the pseudo-Hegelianism of Proudhon. Here we shall consider the direct relationships which exist between Hegel and Marx, reserving for another occasion the analysis of Marx's relation to his Young-Hegelian friends, the Bauers, Ruge, Hess and Engels, who to some extent were the intermediate sources of Marx's early Hegelianism.

The influence of Hegel upon Marx was a two-fold one—methodological and doctrinal. The special, detailed views for which Marx is indebted to Hegel (certain sociological and economic *aperçus* contained in the latter's *Rechtsphilosophie*) will not concern us here, for they belong to a discussion of the cultural implications of Marx's criticism of political economy. Our primary interest will be with the significance of the dialectical method in Hegel and Marx, its place and function in the Marxian philosophy and its relation to a variety of philosophical methods and doctrines which have been opposed to it. But in order to understand the way in which Hegel's *method* became the legacy of Marx and his followers, we must begin with the Marxian criticism of the Hegelian *system*. For Hegel system and method are indissoluble. Indeed he sometimes says that they are one and the same.[5] How, then, was it possible for Marx to discard the Hegelian system of philosophy and yet adopt its method?

I

Hegel and Marx in Opposition

1. *The Religious Motif in Hegel and the Activistic Atheism of Marx.*

That the spirit of the Hegelian philosophy was primarily religious and its systematic logic a rational theology, Hegel

[5] *Science of Logic*, English trans., 1929, I, 65, "Method is no-ways different from its object and content."

was the first to admit. Does not he himself tell us that his logic is "the exposition of God as he is in his eternal essense before the creation of the world and man?"[6] And if Hegel was the first to admit it, Marx was among the first to make the most of that admission.[7] All his differences from Hegel are consistently deduced from an opposition to the teleological spiritual idealism which received its profoundest expression in the Hegelian philosophy. The heart of the Hegelian philosophy Marx declares to be nothing but "the speculative expression of the Christian-Germanic dogma of the opposition between spirit and matter, God and the world."[8] True, Hegel had tried to transcend all dualisms between form and content, mind and matter, self and community, conscience and law by interpreting them as relatively objective aspects of a continuing process. If there was any creation in the Hegelian system, it was an *immanent* creation. At the danger of having his orthodoxy impugned, he had written, "Without the world, God is not God."[9] But Marx pointed out that the developmental process in Hegel was a very peculiar one. It purported to be a development of ideas in terms of a logical and timeless order of necessity, not in terms of the succession of temporal structures. The process is the method by which a cosmic subject attains self-consciousness. The sensuous object, the contingent and underivable, the material world in space and time—all dissolve into appearance. This is what Marx means when he speaks of Hegel's philosophy as the final expression of traditional

[6] *Ibid.*, I, 60.

[7] After Feuerbach, of course. Marx was acquainted with Trendelenburg's criticisms of the Hegelian philosophy in the latter's *Logische Untersuchungen* but was not overimpressed with it. In fact, he planned, at Bauer's instigation, an attack upon it.

[8] *Die Heilige Familie*, p. 186. All references to this work are to Mehring's *Aus dem literarischen Nachlass Marx-Engels*, 1902, Vol. II.

[9] *Philosophy of Religion*, English trans., 1895, I, 200.

religion. He is referring to Hegel's *idealism,* not to his monism or his method.

The logical difficulties which led Marx to abandon absolute idealism for dialectical materialism we shall treat below. Those logical difficulties, however, were sensed from the point of view of an attitude definitely hostile to the doctrinal supernaturalism with which Marx identified objective idealism. In and behind the Hegelian system, Marx saw the God of Western Christendom. A red thread of Promethean atheology runs through all of Marx's philosophical writings. Already in his doctor's dissertation on the *Differenz der demokritischen und epikureischen Naturphilosophie* he uses as a motto the avowal of Aeschylus' Promethus, "In one word—I hate all the Gods."[10] He was struck with the incompatibility between any revolutionary ethics and an objective idealism which sanctified the existing order with ambiguous formulae about the identity of the real and the rational. The emphasis on *the* whole in Hegel, on man *as such* in Feuerbach, made it difficult to re-make, re-do, or reform existence. The social whole develops by a principle of division and conflict. Not by automatic division but by the conscious *action* of men in pursuit of their aims. As a student Marx had already written in the spirit of Hegel's method, "Without parties no development, without division no progress."[11] His repudiation of the disguised social absolutism of Hegel, of the Feuerbachian religion of ethics and the *Liebesduselei* of the "true socialists" followed from the realization that what must be done in behalf of all men in *theory* can be achieved only by proceeding against some men in *practice.* Marx saw no contradiction in believing that to preserve peace it may sometimes be necessary to fight for

[10] *Gesamtausgabe,* ed. by Riazanov, 1927-32, I, 10.
[11] *Gesamtausgabe,* I, 250.

it. A class struggle, e.g., which gives victory to one group, will more readily abolish classes than will class collaboration which by negotiating class interests tends to perpetuate them.

We stress this activistic aspect of Marx's thought for several reasons. First, it calls attention to the extra-logical *interest* of Marx's thought. It helps us to define the locus of Marx's problems not merely in the objective social and ideological milieu in which he found himself but in the relationship between that milieu and his revolutionary *purposes*. It affords insight into the kind of evaluating criteria Marx brought to bear upon the strife of philosophic systems. Secondly, it reveals a constitutional antipathy to any type of social quietism which makes almost pathetic the ingenious attempts on the part of Marx's critics to spell out another variety of economic fatalism from his doctrines.

2. *Political Accommodation in Hegel and Social Revolution in Marx.*

As a corollary from the above we should expect to find a cognate political opposition between Hegel and Marx. And we are not disappointed. The political accommodation of Hegel[12] and the revolutionary activity of Marx are acts spread on the pages of history, not *Gedankenbilder* of historians. Here, however, the obvious facts are not so important as Marx's consciousness of the facts. As a Young-Hegelian, even before he had taken up the cause of social reform, Marx wrote in an unpublished criticism of Hegel's *Rechtsphilosophie* that both Hegel's philosophy of law and philosophical-religious pantheism were political *teleologies*.

[12] Despite the attempts of many critics to rehabilitate Hegel's political objectivity, close study has convinced me that the situation stands even worse for Hegel than it was pictured by the most critical of his biographers, Haym, R., *Hegel und seine Zeit*. Cf. *Journal of Philosophy*, XXVI, 529.

"Diese Metaphysik," he claims, "ist der metaphysische Ausdruck der Reaktion, der alten Welt als Wahrheit der neuen Weltanschauung."[13] Now it is true enough that the main features of Hegel's political philosophy are compatible with his underlying metaphysics. But that does not mean that they are therefore *deducible* from his metaphysics. It was the presence of a fundamental ambiguity in that metaphysics which facilitated the illegitimate conversion of the temporal institutions of the Prussian state into the awesome mansions of the spirit of reason. In Hegel's system "reason" (*Vernunft*) was identified with "reality" (*Wirklichkeit*). Consequently, when Hegel proclaimed his famous dictum, "Whatever is real is reasonable, and whatever is reasonable is real," he was expressing the barest tautology. For by definition everything finite, everything short of the absolute totality is neither perfectly real nor perfectly reasonable. In the popular mind, however, "real" if not synonymous with "existence" at least includes it in its meaning. From the tautology, "Whatever is *real* is reasonable," there seemed to follow the absurdity, "Whatever *exists* is reasonable." It was not until the third edition of the *Encyclopädie* (1830) that Hegel clearly and emphatically distinguished "reality" from "existence." All of Germany had understood the intent of the dictum (published in the introduction to the *Rechtsphilosophie* in 1819) as a justification of the *status quo*.[14] Hegel protested that the maxim was not a defense of political quietism, for not all existence was real.

[13] *Gesamtausgabe*, I, lxxv.

[14] Hegel had already sent his *Rechtsphilosophie* to the press when the revolutionary disturbances at Wartburg took place. He withdrew it in order to add his condemnation of Friess and the liberals. By 1830 his preface had become a public scandal and he hastened to make explanatory amends. But in 1831 he still registered his disapproval of the English electoral reform law and the July revolution in France. Cf. *Schriften zur Politik und Rechtsphilosophie, passim.*

The truly real was the perfectly ideal, the logically complete, the norm. Phrases in popular parlance like "a real man" or "a real triangle" suggest its meaning. The existing state was reasonable only in so far as it was real. But how real was it? And what was the criterion for distinguishing between the greater or lesser reality of any *finite* existence—such as the Prussian state under Frederick William III? It was an easy wisdom to say that no state was completely real nor completely unreal. That did not tell us whether a republican democracy was superior to a limited monarchy. Nor did it attempt to. But it did pretend to derive the historical character, for example, of constitutional monarchy from the purely formal concepts of sovereignty and will.

This last might serve as an illustration of Hegel's approach. He begins his discussion (*Rechtsphilosophie,* Sec. 279) by identifying sovereignty with unlimited self-determination. Nothing can compel or determine the will of that which has the power of final decision. Consequently, sovereignty must be individualized. It cannot be shared, for that would imply the absence of a power of last resort which in turn would involve calling into question our *definition* of what it is to be a sovereign. But only a subject, *i.e.,* what has mind, can be a true individual. And in this world that which is both a subject and an individual must be a "person." Not personality as such *"sondern ein Individuum, der Monarch."* To which Marx properly retorts in the course of a detailed commentary upon Hegel's philosophy of law.

Hegel converts all the attributes of constitutional monarchy in contemporary Europe into the absolute self-determination of the *will.* He does not say "with the will of the monarch lies the final decision" but "the final decision of will is—the monarch." The first proposition is empirical;

the second transforms the empirical fact into a metaphysical axiom [*Werke,* I, 428].

Hegel could no more deduce the existence of monarchy as a metaphysical truth than he could the virgin conception.

The difference between the empirical and the metaphysical approach to politics is best revealed in the opposing definitions Hegel and Marx give of the state, and in the contrary functions they assign to it in relation to society. For Hegel the state is the realization of moral principles and concrete freedom (*Rechtsphilosophie,* Sec. 257 ff.). It is logically primary to society, the condition of all social life. For Marx the state is a product of social life, not its condition. It is a historic outgrowth of society. There are societies without states. The first must therefore be logically and historically prior to the second. Society is an organism in which the state functions as a principle of "organization."[15] It arises, however, only when the organic nature of society threatens to be disrupted by social antagonisms. It functions as an instrumental agency in preserving those antagonisms and yet preventing social disruption. Fundamental social antagonisms ultimately express themselves in conflicting class interests and struggles. They grow out of the whole social process whose secret is to be sought in the relationships which those who consume goods bear to those who control production and distribution.[16] Not only is the state far from being the *Stellvertreter* of absolute reason in affairs political, it is not even an umpire in the class tug of war. It is one of the means by which that war is fought. It does not come to bring reconciliation between classes but to reconcile subject classes

[15] Marx is the source of Tönnies' famous distinction between Gemeinschaft and Gesellschaft. See the preface to his *Gemeinschaft und Gesellschaft,* 1st ed., 1887.
[16] *Das Kapital,* III, 2, 324.

to their lot. In the *Communist Manifesto* Marx declares that "the modern state power is merely a committee which manages the common business of the bourgeoisie." The historic mission of every subject class is to seize power and establish its own state as an engine of social consolidation. States will exist so long as economic classes exist.

There is no way of softening or compromising this opposition between the Hegelian and the Marxian philosophies of state. For Hegel the state represents the principle of absolute reason and spiritual power which bestows upon man whatever value he has.[17] In some mysterious way it is to transcend the rational egoism of bourgeois society. For Marx the state is both the expression and the proof of the irreconcilability of class egoism. For one the state has an independent character grounded in logical-ethical formulae; for the other the state is rooted in the class divisions of existing society. Since for Hegel the state is an institutional sublimation of all social difference he sees what men *theoretically* have in common by closing his eyes tight to what *practically* separates them. His political philosophy is therefore of a piece with his religious philosophy.

3. *Philosophy as Retrospective Evaluation: Philosophy as Contemporary Social Activity.*

Poles apart in Hegel and Marx are their very conceptions of the nature and function of philosophy. For Hegel philosophy in its broadest sense is the *denkende Betrachtung der Gegenstände*—"the thinking view of things" (*Encyclopädie,* Sec. 2). Sometimes, even more simply, it is *Nachdenken.* It is self-enclosed and self-sufficient. It is an activity of thought; literally a *thinking-after.* A thinking, *after* things have been done. Its subject matter is that which *has* happened and its sole purpose the clarification of the happen-

[17] *Philosophie der Weltgeschichte,* Lasson ed., I, 90.

ing. To clarify an event is to explain it in terms of logical necessity. It must be fitted into some developing whole. We must see that it can be no other than what it is. In this way its *meaning* is revealed. All things have a meaning both distributively and collectively. The task of the philosopher is to discover that meaning, progressively correcting his conceptions *after* more and more of the web of cosmic structure has been disclosed to him. The meaning of things is God and the quest for meaning is divine office. "Das Denken," Hegel somewhere says, "ist auch Gottesdienst"; and *das Nachdenken* is preëminently such. There is no call, then, for philosophy "to do" anything. It neither sows nor reaps. Like a virgin consecrated to God, it bears no fruit. It does not come to reform but to understand. In that understanding the world comes to self-consciousness and man rests in God. Hegel reminds his readers in the preface to his *Rechtsphilosophie* that they are not to look for any hints in his work as to how the world is to be changed.

> Philosophy comes too late to teach the world what it should be. . . . When it paints its gray upon gray, a form of life has already become old: and in gray and gray it can no longer be made young again but only understood. The owl of Minerva begins its flight when the shades of twilight have already fallen.

From this professedly impractical philosophy, however, there flowed consequences of a very practical sort. To understand the nature of the world and at the same time to regard the good, the true and the beautiful as *objective* aspects of that world is to make the task of philosophy the rationalization of the existent. It was no accident that Hegel was accused, on the one hand, of sucking the world from his finger tips by a process of logical deduction, and on the other, of writing apologias for the brutely given. Nor is

there anything contradictory in these criticisms. For within a system of teleological metaphysics, where things have immanent purposes and ends which serve as objective criteria of evaluation, all explanation *is* justification, all history *is* theodicy. Evil is interpreted as the necessary counterpoint in a metaphysical harmony. The social order, together with the ethical values and vision generated within it, is part of the systematic interconnection of things. There is a rhythm and pattern in the whole such that no aspect could be affirmed good without affirming the relative necessity of evil. And the philosopher beholding the totality of the world and its works, must declare after Genesis, "And lo! it is good." Once more in keeping with philosophical tradition, a temporary and local ethics was transformed into an absolute metaphysics. The gaping seams in this arbitrary metaphysical construction were apparent even to Hegel. His distinctions between "reality" and "existence" and his belief in the objectivity of chance indicate that. They were doctrines developed to meet three types of difficulties raised by his contemporaries: (a) that the world in some respect could have been different from what it was; (b) that not all lost causes were necessarily unworthy causes; and (c) that irrespective of what the world *has* been, in certain respects it can be made different from what it *now* is.

Marx's conception of philosophy breathes a strikingly different spirit. Practice is the life of theory; theory the guide to practice. The subject matter of philosophy is not "the whole universe indivisible" but specific problems of man, history and culture. An answer to these problems may be recognized as genuine only in so far as it gives us a leverage in something concrete: it may be recognized as true in so far as it enables us to settle the concrete difficulties out of which those problems have arisen. Hegel himself had already proclaimed that all truth is concrete. But for Hegel the most

concrete of all things was an ideal logical system which coherently organized all experience. Thought could discover the truth about this system by thinking itself, *i.e.,* by pure logical analysis, for there was nothing intelligible outside of the system. For Marx the concrete was an existential affair, accessible to thought but not constituted by it. Activity is an integral part of thinking.

The question whether human thought can arrive at objective truth [he writes] is not a question of theory, but a practical question. In practice man must prove the truth, *i.e.,* the reality, power and this-sidedness [*Diesseitigkeit*] of thought. The dispute as to the reality or unreality of thought which is separated from practice is a purely *scholastic* question.[18]

A characteristic emphasis on the unity of theory and practice runs through not only Marx's writings but all of his revolutionary activity as well. A social theory is to be judged by what it effects, and all social theories have practical effects—directly or indirectly. We cannot stop with enunciating what is merely possible. We must choose between actualizing that possibility or accepting the actuality at hand. There is, so to speak, an ethics or politics of thinking which reminds us that merely to speculate about possibilities without inquiring whether they can be converted into existence, is to countenance that particular possibility which already finds itself "accidentally" embodied in existing practices.[19] To theorize about the nature of the good society without trying to make the existing society good is in

[18] Marx's second gloss in Feuerbach, *Marx-Engels Archiv,* 1926-27, I, 227.

[19] Criticising his Young-Hegelian friends in the *Deutsche Ideologie,* Marx writes, "Their demand that our consciousness be changed reduced itself to the demand that the existent be differently interpreted, *i.e.,* that it be accepted by means of another interpretation. Despite their use of "world-shattering" phrases, the Young-Hegelian ideologists are the greatest conservatives." *Marx-Engels Archiv,* 1926-27, I, 236.

effect to accept the existing society. In this way, a theory proud of its impracticality is in reality viciously practical. Pretending to be indifferent to the effects of thought, it has very definite effects of its own. Contemplative philosophies are not removed from life. They represent a way of life and as such must be judged by their consequences. In his analysis of social and philosophical theories, Marx shows himself to be intensely alive to the social practices with which, no matter how reconditely, they are involved. The purpose of his own social theories was to provide that knowledge of social tendencies which would most effectively liberate revolutionary *action*. Philosophy is not retrospective insight into the past; it is prospective anticipation of the future. It explains why the present is what it is in order to make it different. So often an expression of social quietism, or a means of individual escape, philosophy must now function as an instrument of social liberation. The social world is not inherently reasonable as Hegel claimed. It must be made reasonable. In the words of his well-known gloss on Feuerbach, "Until now philosophers have only *interpreted* the world differently; the point is to change it."

There is even a more fundamental sense in which practice is involved in theory. That is the way in which it enters into the process of *thinking* as such. From a wider point of view, practice may or may not be the *goal* of thought, but it always enters as some form of *activity* into the very process of testing our ideas. But a discussion of the way in which Marx transcends the coherence and correspondence theories of truth belongs to a detailed treatment of Marx's logic rather than to his conception of philosophy. We shall elsewhere return to it.

Contemporary philosophers will find it difficult to understand Marx's conception of philosophy. It will become clearer

when it is realized that despite the violent opposition between Marx and Hegel on the place and function of philosophy in social affairs there is one point upon which they are agreed. Philosophy is in some sense a *normative* inquiry. In Hegel this is disguised in the form of a rational theology; in Marx it is explicit. The modern conception of philosophy as an analysis of the fundamental categories of space, time, implication, etc., would have been regarded by Marx, at least, as no part of philosophy proper but as problems in the logic of science. Remove logic, mathematics and the natural sciences from the purview of philosophy and there is nothing left as its distinctive subject matter but the normative consideration of values. For Hegel, values were objectively grounded in the nature of things so that he could delude himself into believing that his philosophy was disinterested and free from any presuppositions. Marx, on the other hand, denied that any philosophy as normative inquiry could be disinterested and frankly avowed his own presuppositions and bias. When Marx speaks of philosophy he is referring to ethical, political or social philosophy and the metaphysical disguises in which they often masquerade. That is why he speaks of philosophical method as criticism.[20] It is a criticism which reveals the values and attitudes, the starting point and secret wishes of our thought. It is a sociology of values investigating the social roots and conditions of what human beings desire. It is not an axiology of values deducing what human beings *ought* to do from self-evident first principles. Philosophy, then, is a criticism of standpoints and methods in the light of the conditions under which they emerge and the purposes which they serve. Its criticism Marx reminds us, "is no passion of the head, it is the head of passion."

[20] Throughout his *Zur Kritik der hegelschen Rechtsphilosophie, Gesamtausgabe,* 1927-1932, I, 607.

It is intelligent criticism, however, because it is passion or will *conscious* of itself.

Against those who would substitute direct criticism of conditions for a criticism of the philosophy which those conditions produce, Marx argues that philosophy in the form of value judgments and attitudes is really part of those conditions and plays a part in keeping them as they are (*Gesamtausgabe,* I, 613) ; against those who would restrict criticism to a consideration of technical philosophy, Marx argues that since every philosophy has its material presuppositions, a truly radical criticism must involve changing the material conditions which are at their basis. The new philosophy will triumph not because it represents objective truth but because it fulfills the *needs* of human beings and the social conditions which generate those needs. "Theory becomes realized in a people only in so far as it is the realization of its needs" (I, 616).

In any given society in which class divisions give rise to conflicting needs, values and ideals, each class sets itself up as a representative of the common interest of the community. Each class develops an ideology which it holds to be objectively true and around which it seeks to rally society at large. But according to Marx, only that class has a right to speak in the name of society which in emancipating itself removes the source of all further class conflicts. In bourgeois society, that class is the proletariat. The proletariat will not seek to found social freedom "upon the inhuman conditions which society itself creates but will reorganize the conditions of human existence upon the basis of human freedom" (I, 619). In attempting to do this, the proletariat finds in philosophy its intellectual weapons and philosophy finds in the proletariat its material weapons. "Philosophy cannot realize itself without abolishing the proletariat; the proletariat

cannot abolish itself without realizing philosophy." In a classless society there is no longer a philosophy of law, ethics and politics but a positive *science* of law, ethics and politics. For where fundamental needs and values are the same for all classes, their administration and control depend only upon intelligence. Only under such presuppositions can there exist such sciences. That is the kernel of Marx's conception of philosophy as opposed to that of Hegel. It expresses the insight that in a class society all social sciences are class sciences. In the classless society all social philosophy is transformed into social science; while even now, technical philosophy, which regards itself as the queen of sciences, disappears without remainder in the special sciences.

In discussing the relation between philosophy and science, Engels wrote:

> As soon as each special science clarifies its position in relation to the totality of things and our knowledge, then any special science of this totality becomes superfluous. The only discipline that survives of the whole of traditional philosophy is the science of thinking and its laws—formal logic and dialectic. Everything else is absorbed in the positive sciences of nature and history.[21]

4. *Systematic Philosophical Idealism versus Scientific Materialism.*

The philosophical opposition of Marx to Hegel was not confined to political and social philosophy. It extended to the wider domain of the relation between man and nature, thought and things—to the field of metaphysical and logical analysis. Marx's materialism, as we should expect, is not defended as a form of traditional philosophy or metaphysics at all. Like Feuerbach, he believes that critical materialism

[21] *Herrn Eugen Dührings Umwälzung der Wissenschaft*, 12th ed., 1923, p. 11.

spells the end of traditional philosophy. Why? Because he regards materialism to be the clearest expression of the methodology of science. In fact, he often uses the two terms synonymously as when he says that a certain method is "the only materialistic, and therefore the only scientific one" (*Capital,* I, 406, English trans.). It was inevitable that he reject absolute idealism and embrace a thoroughgoing naturalism which, like science, took the world as it found it and limited itself to piecemeal description. Marx's naturalism, however, is only the beginning of his philosophy, not the end of it; for he was interested in taking the world as he found it in order to change it more effectively. It is, therefore, possible to share Marx's oppositions to Hegelian idealism and use the same arguments against it without subscribing to Marx's social philosophy. And in the interests of historical accuracy, it should be noted that Marx's criticisms of Hegel are really an abbreviated restatement of Feuerbach's brilliant analyses in his *Zur Kritik der hegelschen Philosophie* (1839) and his *Vorläufige Thesen zur Reform der Philosophie* (1842). Marx himself was a Feuerbachian when he penned his criticisms but a Feuerbachian, as we shall see, with a difference.[22]

Hegel had claimed that his philosophy was "the exposition of God as he is in his eternal essence before the creation of the world and man." The nub of Marx's criticism is that everything which makes that exposition intelligible is derived from the nature of the world and man as already exhibited in actual experience. Like all a priori philosophies purporting to express significant material truths about existence, the Hegelian philosophy succeeds only where it has sublimated and hypostasized those aspects of the world which have been revealed in the long course of human discovery.

[22] The relation between Marx and Feuerbach will receive detailed treatment in a forthcoming study.

Secretly starting from "what is," it proceeds to a demonstration that "what is," is, because it "must be." This becomes possible only when the last fruits of what has developed in *time* are illegitimately converted into the first principles of what subsists in *logic*. The forms which experience has shown to be *conditioned* by nature and human activity, Hegel had declared a condition of that activity. The consciousness of real subjects which appears in history as an effect of natural causes, Hegel has transformed into an "absolute subject" which is the cause and ground of those natural causes. The interaction which takes place between the human mind and its external environment, Hegel interprets as a continuous process of diremption and progress on the part of logical categories.

There are three elements in Hegel [wrote Marx], Spinozistic substance, Fichtean Self-consciousness and the Hegelian contradictory yet necessary unity of both—the absolute spirit. The first element is metaphysically travestied nature in its separation from man; the second, is metaphysically travestied spirit in its separation from nature; the third is the metaphysically travestied unity of both, real man.[23]

The result of Hegel's procedure is to make the familiar appear to be a mysterious product of the ghostly conjugation of categories. Instead of starting with the familiar and working out the logical categories involved in ordinary experience, he tries to deduce the character of ordinary experience from presumably simple and necessary logical truths. As it is, complains Marx, "What should be a point of departure becomes a mystical result and what should be a rational result becomes a mystical point of departure."[24]

[23] *Die Heilige Familie, Nachlass*, 1902, II, 247-48.
[24] *Aus der Kritik der hegelschen Rechtsphilosophie.* A commentary on Sections 261-313 of Hegel's *Philosophy of Law, Gesamtausgabe* I, 1927-32, 447.

The source of the mystery is that for Hegel the process of thinking about things is a process of construction. Not content to say that we clarify our ideas by controlling and manipulating things which have an antecedent existence, Hegel maintains that the clarification of ideas is a method of *deducing* the very existence of those things. He scorns abstractions because they give partial knowledge of only the aspects of concrete things. A true idea is one which systematizes all abstractions into a patterned unity which *is* the concrete. There is nothing intelligible in anything which is outside of that unity. For Marx the existence of a thing is as intelligible as it is discovered to be. It is the subject of all possible attributes which may be predicated of it but it is not therefore merely the systematic totality of such predicates. The more we know about the attributes, the more we know about the thing. But the existence of the thing does not depend upon the order in which we learn of its attributes nor even upon their subsistence.

> The method of advancing from the abstract to the concrete [Marx argues], is but a way of thinking by which the concrete is grasped. It is by no means, however, the process which itself generates the concrete.[25]

What Marx is protesting against is Hegel's attempt to deduce the historical succession of things in time from the immanent development of ideas out of time. From logic we can never get the existence. Nor from existence to logic, some modern logicians would add. But this is just what Marx attempted to do. "In oppositions to German philosophy which descends from heaven to earth, we rise from the earth to heaven."[26] Before thought can discover logical relation-

[25] *A Contribution to the Critique of Political Economy,* Introduction, English trans., 1904, p. 293.
[26] *Deutsche Ideologie, Marx-Engels Archiv,* 1926-27, I, 239.

ships the object of thought must possess them. The object of thought is always ultimately some aspect of existence. We can speak intelligibly of logic only as the logic of some existential subject matter. It is not itself a *separate* subject matter, although it can be considered in distinction from other subject matters.

The thinking that discovers this logic is utterly foreign to the romantic personifications of the self to be found in German idealism. It is the consciousness of human beings and is rooted on the one hand in the "life-process of the brain" and, on the other, in the social community from which man draws his language and culture. "Consciousness can be nothing else than conscious existence." The only conscious existence we know is man. As a close student of Hegel's *Phänomenologie des Geistes,* Marx was impressed with the emphasis upon the *activity* of mind in the knowing process. As distinct from the metaphysical materialism of the eighteenth century, he believed that the object of knowledge does not impress itself upon a passive consciousness. What is known is not something finally given but also something acted upon. It is the product or outcome of the interacting development of consciousness with things existing antecedently to consciousness. Hegel and Marx are agreed that consciousness plays an active rôle in knowing. They differ as to the nature of consciousness and the degree of its activity. For Marx all thought is human, not absolute; it transforms but does not create. Hegel's theory of mind is a mythological expression of empirical psychology. Criticizing Hegel in *Die Heilige Familie* he writes:

The *Phänomenologie* consistently enough ends by putting in place of all human existence "absolute knowledge": knowledge, because that is the only form in which self-consciousness exists and because self-consciousness is supposed

to be the only proper form of human existence; absolute knowledge, because self-consciousness is concerned only with itself and is no longer embarrassed by an objective world. Instead of treating self-consciousness as the self-consciousness of real men, living in a real, objective world and conditioned by it, Hegel transforms man into an attribute of self-consciousness. He turns the world upside down. [*Nachlass,* II, 304].

Having done so his problem is to get all the furniture of heaven and earth out of the absolute unity of self-consciousness. In keeping with the Neo-Platonic tradition of German idealism, he is compelled to resort to the mystical and magical device of making "ideas," or the states of self-consciousness, the activating and creative forces of the real world.

For Hegel the process of thinking, which under the name of the Idea, he even transforms into an independent subject, is the demiurgos of the real world, while the real world is only its external, appearance. With me, on the contrary, the ideal is nothing else than the material world reflected by the human mind, and translated into forms of thought [*Capital,* I, 25].

As a thoroughgoing naturalist Marx was particularly sensitive to the place and importance of *time.* Hegel's difficulties with time were notorious. He cannot grant its "reality" since there is a contradiction in supposing that the absolute self undergoes real change in time. He must, however, acknowledge its "existence" and he does so grudgingly by referring to it as the external and alienated form in which the absolute self appears. "Only the natural in so far as it is finite is subject to time; truth, Idea and Spirit, however, are eternal."[27] This distinction between time and eternity serves to justify the contention that the *logical* development

[27] *Encyclopedia of the Philosophical Sciences,* Sec. 258.

of categories is outside the temporal process; only our knowledge of that development is temporal. But by Hegel's own method it can be shown that this distinction between time and eternity does not help matters. Time and eternity cannot be contrasted unless both are aspects of a concrete whole. They must be *relative distinctions* within *every* situation and not metaphysical absolutes. They are given together and have as variable a content as the distinction between matter and form. One is not prior or superior to the other. Every significant existence in time is part of the eternal and nothing is eternal which cannot be intelligibly predicated of what has temporal being. In Marx's eyes to refer to the development of categories as ontologically independent of the development of existential subject matter was metaphysical extravaganza. It could only be done by first dissociating development from time and then reducing development to a purely formal attribute of the absolute. But when the eternal contents of the absolute were examined, all that could be found was an inverted and skeletal transcript of what existence had previously been discovered to be. The very conflicts and polar antagonisms between the logical categories —which were supposed by Hegel to represent the "life-history" of spirit—could only be concretely and harmoniously unified because there was already an implicit reference to the productive activity of temporal existence. The logical resolution of categorial conflicts followed, and did not precede, the actual forms of natural, temporal behavior.

Marx's naturalism leads him logically enough to a critical historicism, especially in the field of social science and culture study. Critics have unjustifiably interpreted Marx's historicism as implying extreme relativism, as denying any element of objective truth, and as involving the radical fail-

ure to distinguish between the subject matter of development and the logical formula of that development. Marx does definitely say that

> ideas and categories are not more eternal than the relations which they express. *They are historical and transitory products.*[28]

But here he is speaking of the *social relations* which are so expressed. It does not follow, because the social relations and categories have a history in time, that the physical and logical categories which enable us to express that history have themselves the same *kind* of historical careers. Everything cannot be historical, for then the word unhistorical would have no intelligible meaning. The term "historical" in Marx's writings is relative and is used to distinguish his standpoint from those who would reduce the life of men in society to the "natural." If we say that nature, too, has a history, we are distinguishing it from that which we call "logical." The logical must then be regarded as the limit of that which is always involved in existence.

This naturally poses the question as to the relation between logic and existence or the problem of universals. It cannot be too strongly emphasized that Marx is not a nominalist. His criticism of the concrete universal in Hegel amounts to a proof that if logical relations are to be regarded as states of absolute mind—an essentially anthropomorphic view—then ontological nominalism cannot be avoided.[29] Historically Marx recognized the philosophical kinship of nominalism with the crude materialistic metaphysics of Hobbes (*Nachlass*, II, 236) and the subjective idealism of Berkeley, posi-

[28] *Poverty of Philosophy*, English trans., 1910, p. 119.

[29] Marx's criticism of the Hegelian concrete universal will be found in that brilliant section of *Die Heilige Familie* entitled "The Secret of Speculative Construction." Space does not permit of its detailed analysis here.

tions from which he never hesitated to dissociate himself. Even Feuerbach was suspect at one period for suggesting that natural laws were interpretations of social experience and not objective reports of the inherent structure of things. It is clear that a philosophy which sought to formulate a program of action on the basis of the objective tendencies of social development could not adopt the nominalistic position according to which those tendencies would be merely convenient names.

If any further proof of Marx's realism were needed, his objective theory of value and the whole methodology of abstraction in *Capital* would be sufficient to establish this position. The value of a commodity is not something we can see or smell or touch; it depends neither upon our desire nor will. But given certain social conditions of production, values are discovered to be involved in the exchange of commodities without anyone's intending that it be so. "Although invisible the value of iron, linen and corn has actual existence in these very articles" (*Capital* I, 107). But it does not follow that because Marx rejects nominalism he must accept an extreme, objective, logical realism which converts the outcome of a process of natural discovery and classification into the ontological presuppositions of that process. Exchange values have no subsistence prior to the existence of commodities in space, time and society. In repudiating Hegel, Marx is also repudiating Plato and the whole Platonic tradition. Exchange value is not a concrete universal since its nature is not altered by the differently qualitied use-values which exemplify it. Neither is exchange value, nor any other category of political economy for Marx, an abstract universal such that it can be significantly applied to all possible historical economies. Marx left the investigation of what was invariant in all possible systems of ethics, law, economics,

etc., to those whose ideal of scientific method forbade them to consider the specific determining categories of any historical phenomena and who were content with the help of formal logic to elaborate upon purely formal definitions. Anything which exists is an exemplification of some universal. That is why it can be understood. But there are no universals without exemplification. That is why universals have meanings which can be communicated. There are no incommunicable meanings.

In turning Hegel, to use Marx's own words, "right side up again," Marx was definitely returning to the position of one whom Hegel had turned "wrong side up"—Aristotle. If Marx's philosophic method was Hegelian, his fundamental metaphysical starting point, as Engels admits,[30] was Aristotelian—an Aristotelianism saturated with temporalism, freed from the dogma of fixed substantial forms and the poetry of the Prime Mover. Dialectical materialism has its basis but not its fulfillment in Aristotle's naturalism.

5. *History as the Autobiography of God: History as the Pursuit of Human Ends.*

The fundamental systematic opposition between Hegel and Marx focuses itself most sharply in their respective philosophies of history. For Hegel history is the march of the spirit toward freedom. Freedom can be found only in

[30] In a much neglected passage in his *Ludwig Feuerbach und der Ausgang der klassischen Philosophie* (Duncker ed., 1927, p. 28), Engels categorically states that the question of the relation of thought to existence is essentially the same as the questions: Which is primary, spirit or nature? Did God create the world or does the world exist from eternity? Depending upon whether we answer the first or second alternative of the disjunction affirmatively, we are idealists or materialists. He then adds: "Originally the expressions Idealism and Materialism signified nothing else than this, and we shall not use them in any other sense but this. Confusion results when we import any other sense into them." The connection with the methodology of science on the one hand and the naturalism of Aristotle on the other is obvious.

self-consciousness. Absolute self-consciousness is God. History is the autobiography of God. The logic of the system demands not only that reason pervade the universe but that the rule of reason be established in the historical chronicle of human experience. There is an objective meaning in history. It is to be traced in "the development of the Idea of freedom." Not merely your conception of freedom or mine, for that is but a subjective moment in a process which includes it and infinitely more. That process can best be read (*after* the event, to be sure) in the "objective mind" of the community, in its traditions, laws, ethical use and wont. When we grasp the structure of this cultural pattern and realize the minor part our subjective will plays in it, then we shall correct the critical one-sidedness of trying to make the world reasonable according to our own petty conceptions. Instead of trying to reform or revolutionize things, we shall devote our lives to understanding them. And understanding, as we have seen, consists in catching the vision of the reasonable already embodied in the real.

But this is almost too much—the un-Hegelian reader is tempted to exclaim. The historically real is a depressing record of tragedy, stupidity and heartbreak. Its pages reek with the blood of the innocent. Its logic is the logic of force. Only by chance does anything reasonable emerge. But here Hegel rises to truly great speculative heights. All of this record of confusions is the work of *die List der Vernunft*—"the cunning of Reason." In its operation is to be found the mechanism of history. Everything is grist to its mill. It realizes its own secret purposes through events which seem to man arbitrary and meaningless. The nearsighted passions of the mob, the flaming ideals of the hero, the coward's fear as well as the fool's blunder—all serve its ends. Revolution and reaction help. It dangles the bait of personal interest before

men and thereby gets its own work done. Nothing is altogether meaningless nor without significance in world history. It must merely be properly construed. And if anyone fails to recognize in this teleological fatalism a belief in Divine Providence, Hegel himself confesses it.[31]

Marx's objection to the Hegelian philosophy of history is that as a *philosophy* it has nothing to do with history, the latter being added as an afterthought; and that as actual *history* it disproves his philosophy.

> An esoteric, speculative history precedes the exoteric empirical history. . . . The history of man is transformed into the history of an abstraction [*Heilige Familie,* p. 186].

Discounting the apologetic element in Hegel's treatment, even his empirical interpretations were inadequate. Instead of taking as point of departure the activities of human beings in pursuit of their workaday aims and the conditions under which they are formulated, he begins with the ideas and thoughts which men offer as an explanation of those ends. It was inevitable, then, in accordance with Hegel's pernicious habit of turning a temporal existent into an ontological preexistent, that these ideas be transcendentally capitalized into *Vernunft.* After that it was child's play to apply the logical scheme of the dialectical triad and "prove" that a certain highly selected series of temporal data "progressively real-

[31] "Reason is as cunning as it is powerful. Cunning may be said to lie in the inter-mediative action, which, while it permits the objects to follow their own bent and act upon one another, till they waste away, and does not itself directly interfere in the process, is nevertheless only working out the execution of its aims. With this explanation, Divine Providence may be said to stand to the world and its process in the capacity of absolute cunning. God lets men direct their particular passions and interests as they please; but the result is the accomplishment of—not their plans, but His, and these differ decidedly from the ends primarily sought by those whom He employs." *Encyclopedia,* Sec. 209, Zusatz, Wallace trans. Part of this passage is quoted by Marx in an interesting connection in *Capital,* I, 199 n.

ized'' an end which had been set before history proper began.

Marx did not deny that there was an order to be found in history. He denied that there was a teleological order. He did not deny that there was determinism in history. He denied predeterminism or fatalism. He shares with Hegel the belief that the order of historical events is more than a confused record of chance occurrences. He does not claim that anything could have happened in the past. Nor that there are unlimited degrees of freedom in the present and the future. But he differs from Hegel in refusing to believe that what did happen has any more meaning than what individual men can find in it.

History, Marx is never weary of repeating, is made by men. It is not the product of the *automatic* operation of impersonal forces whether they be spirit, nature, the mode of economic production or what not. Human effort is the mode by which the historically determined comes to pass. Nor does history make itself in the form in which story tellers and idealists love to personify it.

History does nothing; it ''possesses no colossal riches''; it ''fights no fight.'' It is rather man—real, living man—who acts, possesses and fights in everything. It is by no means ''History'' which uses man as a means to carry out its ends as if it were a person apart; rather History is nothing but the activity of man in pursuit of his ends [*Nachlass,* II, 179].

Now in places even Hegel admitted *malgre lui* that men make their own history. He even has a keen eye for the conditioning factor of geography. But in trying to explain any specific event, he seeks for causal insight in the ideas men carry in their heads and the slogans with which they march into battle. Marx, however, seeks a causal explanation of historical activity not in the way people think, not in their abstract ideas, but in their concrete needs and in the conditions

out of which those needs arose. Human need is the driving force behind action and behind the plausible reasons we advance to justify that action. Need gives man his problems and the strength to conquer them. Need—"the practical expression of necessity" as Marx calls it—brings human beings to consciousness, to class consciousnes, to revolution. *History, then, can be explained rationally but it is not made by reason.*

It is true that man, generically, makes his own history. It is not true that any individual man makes his own history. Marx is not interested in what the individual man makes or does not make. He is primarily interested in the behavior of groups or classes and in the individual only in so far as he is a member of a group or class (*Capital,* I, 15). Human history is social history. But society since primitive times is class society. History, therefore, is the record of the rise, fall and struggle of classes. The succession and struggle of classes —now rapid and violent, now slow and peaceful—centers ultimately around the possession of property and the power which that possession gives. Not that individuals *as such* are necessarily motivated by economic considerations, but that no matter what their motives as individuals are, the resultant effects of their common activity differ from the outcomes they had severally anticipated. In movements of large masses, extreme variations in the will or actions of individuals are compensated by other variations. The activity of a class and the consequences of that activity are not *necessarily* deducible from the motives of individuals composing that class nor vice versa. It follows that from the point of view of a history interested in *class* struggles, the activity of any particular individual is a chance event (not, however, from the point of view of a biologist or a psychologist). That chance events are important, the existence of great men at any time indicates. Yet they are not of determining im-

portance in social history. They are limited by the objective class issues which exist independently of them. And they are even more significantly limited by the contemporary interests of the group or class without whose support they can accomplish nothing. It may be a chance event that a great man appear when and where he does, but the scientific historian cannot regard it as a chance event that a great man becomes a representative of a certain class. Classes do not make any individual "great." But they give him both the opportunities of greatness and the means to make that greatness effective.

If all history is the history of class struggles, how and why do these struggles occur? Here instead of Hegel's *List der Vernunft* and the other unverifiable notions of eclectic historians (chance, unconscious, will, etc.), Marx offers an empirical principle of determination, viz., the development of the mode of economic production. Man is continually improving the quality of the tools he uses in earning his living. The possession of the new productive forces and the invention of new methods give a natural advantage over those who still live by the old. The class which has title to the new forces of production has economic power—a power, however, which is hampered by the legal and political property relationships which express the *earlier* forms of material production. When the opposition is acute, a social revolution takes place. Unless society is destroyed in such a conflict, victory comes to those who fight for a form of social organization which corresponds to the change in the mode of economic production. *Political* power is transferred to that organized class which has *economic* power. The development in the mode of economic production is continuous and irreversible. Consequently, with the passage of time, there is an ever-narrowing range of possibilities of social organization. The

development of human society shows a *direction,* by no means linear, but which is none the less empirically observable. It is a direction which points from a crude, primitive communism, through the various forms of private property in the instruments of production—slavery, feudalism and capitalism—to a complex industrial communism in which "the free development of all is the condition for the free development of each."

If for Hegel, history is a progressive realization of *freedom,* for Marx it is a progressive development toward the *socialization* of the means of life. Without such socialization, freedom is a fetish—an empty, formal right which cannot be exercised. As contrasted with Hegel, Marx's philosophy of history is at once realistic and dynamic, empirical yet hostile to the belief that "social facts" exist ready made *in rerum natura.* It fuses the logic of analysis with the poetry of passion. It is the philosophy of a class which does not merely desire to "understand" revolution but to make one.

II

Hegel and Marx in Continuity

We have emphasized the systematic contrasts between Hegel and Marx for two reasons. First to make more effective the exposition of what unites them in a common opposition to formal Kantian idealism on the one hand, and to sensationalistic empiricism on the other; and secondly, to close the door tight to attempts at *"Ergänzung"* Marx by Hegelianizing him, which is commonly expressed in a rather patronizing interpretation of Marxism as an erring and one-sided variety of Hegelianism.[32] The two philosophies are ut-

[32] Plenge's *Hegel und Marx* (Tübingen, 1911), is the best illustration of this. Croce in Italy, and to some extent, Lindsay in England, are also cases in point.

terly opposed in substance and in spirit. But how, then, it may be asked, can they be linked together? What can they significantly have in common? The answer may be suggested by a double metaphor. Because they fought against the same opponents, they share certain positive *doctrines*. These receive, however, characteristic emphases in terms of their systematic standpoints. Because they fought against each other with the same weapons, they share a common method. The method, too, bears traces of their different metaphysical allegiances. In Hegel the method is derived from the system; in Marx the system—or whatever there is of one—from the method. In this section, we shall be concerned with the leading positive doctrines common to both philosophers; in the next we shall examine their method.

1. *Opposition to Social Atomism.*

The three fundamental propositions of the Hegelian philosophy are: reality is spiritual; reality is systematic; and reality is rational. The doctrine of corporate social consciousness expressed in the order of objective mind was a logical consequence of these positions. And from it there followed as a corollary the denial of the different varieties of metaphysical and social atomism which flourished in France and England. Whether it was the theory of the "social contract" of natural man or the doctrine of the "well-understood interests" of utilitarian man, Hegel sensed in them a dissociation of the individual from the social whole without which individuality could have no meaning. The social whole was both logically and historically prior. Doctrines which tried to base a social philosophy upon the desires of the empirical self—a self which made its own bargains, selected its vocation, and ordered its life in independence of the lives of others—were viewed by Hegel as attempts to splinter the

unity of social activity into innumerable, tiny fragments. Each fragment—partial, limited, and unconscious of its history and interrelations—regards itself as a cosmos in which the other fragments are mirrored as distorted reflections of itself. In multiplying these atomic absolutes the organizing relations which bind them into a larger whole are dissolved. For example, take bourgeois society which Hegel in the *Phänomenologie* calls a *geistiges Tierreich,* "society as a human herd." Here every atom regards himself as central and treats all other atoms as extrinsic means to the fulfillment of his personal, irrational ends. There can be no rational planning or purpose in it, since rational *willing* for Hegel means willing informed by the structure of the whole.

For Hegel genuine individuality is an articulation of both the logic and the ethics of the whole. It is not the starting point of activity but the realization of activity; not the presupposition of society, as in the abstract individualism of the contractualists, but the outcome. It must be noted that for a naturalist this individuality is of a very peculiar sort. Since the truly individual is revealed in the systematic character into which things enter, Hegel claims that the higher the system the truer the individual. The family is more of an individual than its members, the community more than the family, etc. Obviously the only completely "real" individuality is the Absolute. In it the finite personality is realized (to the finite mind, however, destroyed). But even the naturalist must grant the Hegelian insight into the social basis of individuality. And it is in terms of this insight that we are to understand Hegel's opposition to the untrammeled individualism of the Enlightenment; his denunciation of all conscience philosophies whose "*ich* kann nicht anders" was erected into a universal and categorical imperative for the world at large; and finally his rejection of all supernatural theories of duty and reward.

The social relation between individuals Hegel substantializes as the institutions, customs, and laws of the community. *Moralität* has its roots in *Sittlichkeit*—the ideals of social life in the practices of social life. Hegel's *Sittlichkeit* is a jealous God. It is the source, substance and repository of all that the individual creates. It owes little to him, he owes everything to it. It countenances no revolts especially when they fail. In his early years Hegel shows no hesitancy in attacking Christ and his disciples for their divisive and non-social morality. He scornfully contrasts their activities with the life of Socrates who, although opposed to the existing order, accepted the state and its laws to the very death (*Jugendschriften,* ed. Nohl, pp. 219 ff.).

The crux of Hegel's opposition to social atomism lies in his demand that human activity be organized not in terms of personal motives or interests but in terms of an objective *status* in a differentiated social whole. Rights are the natural expression of one's station and duties, not the result of a contract between independent individuals. Independence is conditional upon a myriad of prior dependencies which flow from one underlying social bond. The ideal community for Hegel is a *Schicksalsgemeinschaft* in which all would find a common fulfillment. It is the ocean floor which links together islanded and isolated selves. It does this by a continuous tradition which furnishes the individual with the goals of his activity and with ideals to judge his performance. Personal, exclusive interests cannot enter here at all. Whoever attempts to answer the question "Whether and how one is to act," by an appeal to personal interest is guilty of a form of self-diremption (*Phänomenologie,* p. 262). He does not know his own real interest nor the nature of the self in whose presumable behalf he is acting. This is the position into which the tradition of classic German idealism develops. Through Lasalle who had absorbed everything in the

Hegelian philosophy except its conservatism, and through Marx who eliminated its transcendental psychology, the corporate or collective ideal of social life made its way into the ideology of social democracy.

In Marx the analysis of the nature of social activity is conducted on an empirical plane. The unity of social consciousness is an historical and sociological fact, not a metaphysical assumption. Marx does not ask as the idealists did, "How is social conciousness possible?" but "How does social consciousness arise?" And he answers this question not merely by a genetic inquiry but by an investigation of the social conditions under which consciousness is discovered. Before there is *a* man, there are men.

Since he comes into the world neither with a looking-glass in his hand, nor as a Fichtean philosopher, to whom "I am I" is sufficient, man first sees and recognizes himself in other men. Peter only establishes his own identity as a man by first comparing himself with Paul as being of like kind. And thereby Paul, just as he stands in his Pauline personality, becomes to Peter the type of the genus homo [*Capital*, I, 61].

Not only is the nature of the bond between Peter and Paul nonmetaphysical, it is not even, in the first instance, psychological. It is practical. Peter discovers Paul's body and Paul's acts before he discovers Paul's mind. Men need one another in order to live before they need one another in order to converse. In fact, says Marx in a passage which sounds amazingly modern, man's consciousness is his speech; and speech arises out of the concrete needs of social exchange. Consciousness is social before it is individual. Peter discovers the *us* before the *me*.

Man has consciousness . . . but it is not pure consciousness. "Spirit" is cursed with the burden of matter which here takes the form of sounds and currents of air in motion, in short, speech. Speech is as old as consciousness. Speech *is*

practical, real consciousness, existing for other people and consequently existing for me. Speech like consciousness arises from the need, from the necessities of social intercourse.[33]

Society is just as real as any or all of its members. Although it does not exist apart from the individuals who constitute it, it cannot be reduced to them. It is an order out of which individuals arise and acquire their very individuality. From it they receive an atmosphere for their short flight, and through the social memory funded in tradition an opportunity for immortality.

The interdependence of human beings, Marx claims, is both logically and historically found in the division of labor —a principle which applies to every type of organized society. It does not determine, however, the specific type of organized society within which men work. But when under certain historical conditions, a commodity system of production arises, the principle of division of labor links together the social status and opportunities of men in such a way that they can no longer intelligently regard themselves as independent. The organic unity of the mechanism of production makes it impossible to calculate the significance of an economic event in terms of personal intent or immediate consequence. The wealth of one class means the poverty of another; a bankruptcy here means distress there, and prosperity somewhere else. Yet the official theory of commodity-producing society with its laissez-faire economics and politics, without denying the facts of economic interdependence

[33] *Deutsche Ideologie, Marx-Engels Archiv,* 1926-27, I, 247. Marx's empirical analysis of social consciousness in this work seems to me to give the coup de grâce to the perversely ingenious attempts of Prof. Max Adler to derive the whole concept of "socialized man" in Marx from Kant's "transcendental unity of apperception." Cf. "Kausalität und Teleologie im Streite um die Wisssenschaft," *Marx-Studien,* 1904, I, 195 ff. Also *Kant und der Marxismus,* 1925, pp. 135 ff.

within society, denies the psychological, ethical and social consequences of that interdependence.

These consequences may be summed up in the proposition that the effects of *uncontrolled* interdependence produce different social status; produce different manners of living and thinking; in short, produce different men. The denial of this conclusion may be expressed in the proposition that different social status do not affect the essential equality and freedom of the human will. Say the laissez-faire philosophers, man is free to work or not to work. His contracts to sell or buy are the legal expression of that freedom. The open market is an an avenue to an open career. Nominally and actually the man who comes to sell his labor power is just as independent as he who comes to buy it. Their negotiation is a fair battle of wits, stamina and courage. Whoever gets the better of the bargain is the better man. It is no one's concern if society is the loser. Listening to these doctrines, especially as they bear upon the sale and purchase of labor power, one would believe, Marx declares, that in this sphere we had a veritable Eden of the innate rights of men. There alone rule Freedom, Equality, Property, and Bentham. Freedom because buyer and seller . . . of labor power are constrained by their own free will. . . . Equality because each enters into relation with the other, as with a simple owner of commodities, and they exchange equivalent for equivalent. Property because each disposes only of what is his own. And Bentham because each looks only to himself. The only force that brings them together and puts them in relation with each other, is the selfishness, the gain and the private interests of each. Each looks to himself only, and no one troubles himself about the rest [*Capital,* I, 195].

Bourgeois society is a society officially antisocial in theory. It treats its members as if they were atoms—as if they were almost as hard, elastic and impenetrable as the atoms in the kinetic theory of gases. But the nature of society makes it

impossible to carry this policy out. Individuals are not atoms; none is self-sufficient. "The egoistic individual of bourgeois society may in his silly imagination and petrified abstraction puff himself up into a self-sufficient atom, that is to say, into an absolutely complete and blessed creature, independent and free from any need,"[34] but his daily experience and activity compels him to recognize his manifold interrelationships with others. There are social bonds that none may escape. But what he in effect does is to convert one kind of social bond into another. He can only live by making demands upon others. He therefore must tie them to himself by powerful cords of need. But in so doing his very own qualities and characteristics become "needs" which others must fulfill. In these others, however, he can see only the instruments of satisfaction for his needs. Human beings become means not ends. The whole social environment of persons and things now become objects of *interests.* To be is to be perceived in relation to some interest. These relations are objectified in numerical figures in cashbook and ledger. They potentially dominate and ultimately dissolve other relations which at first sight seem utterly foreign to lowly economic interests—family, school, church and culture. Pretending that individuals are free and equal before the law and in the market, the bourgeoisie has cynically torn away the countless social ties which make men members of one another's body and "left no other bond betwixt man and man but crude self-interest and unfeeling 'cash payment'" (*Communist Manifesto*).

2. *Rejection of Abstract Ethical Idealism.*

Opposition to the excesses of rabid individualism, however, comes not only from social realists but even more often

[34] *Die Heilige Familie, Nachlass,* 1902, II, 227.

from ethical idealists. Indeed it is in this latter form that it is most vocal and emphatic. What age has not heard a cry for justice in the name of Christ, Kant or some other ethical prophet? When has not someone's conscience, somone's devotion to things invisible led to conflict with the social order? And yet both Hegel and Marx regarded abstract ethical idealism, whether it have its roots in Christ, Rousseau or Kant, as Utopian and unreasonable—as even more dangerous than any philosophy of social atomism. It involved the same denial of the priority of the group over the individual; the same acceptance of the natural rights or conscience-ethics which lies at the basis of philosophical anarchism. Because it endangered the stability of the state, Hegel stamped it as a revolutionary doctrine; because it hampered militant class activity, Marx condemned it as counter-revolutionary.

That Hegel's thought is marked by an intense antipathy to abstract ethical idealism, all of his published writing unmistakably show. The extra-philosophical motives and problems which drove him to that antipathy have been clearly revealed in his early manuscripts, published since his death.[35] Here, however, we merely wish to present the expression of that opposition at the very outset of his philosophical career. The corpus of manuscripts which have been edited by Nohl under the title *Theologische Jugendschriften*

[35] We may dogmatically state them here and document them at another time. They were (1) opposition to the slogans of personal liberty and political freedom which Hegel believed had prevented German national unity and prepared the way for the degradation experienced by Germany at the hands of Napoleon. Hegel bitterly characterizes this view as being equivalent to, "Fiat justitia, pereat Germania"; (2) a desire to draw the teeth of French rationalism which believed that thought could legislate for society. Hegel connects the revolutionary excess of the French revolution with this doctrine. (3) A profound absorption in and nostalgia for the classic Greek tradition which represented for Hegel the reconciliation of freedom and law. The influence of Hölderlin was significant here.

contains a critically hostile evaluation of Christianity both as a theoretical doctrine and as a social movement. Greek religion and morality fused into an organic political entity is held up as a model of what a people's religion should be. Social ties exist before ethical commands. The function of the latter is to enforce the former. From this point of view, Christ's injunction to his followers to love one another, as well as all the deliverances of Kant's categorical imperative, are declared to be vapid when not actually dangerous. "A love of man which is to extend to everyone even to those who are not known to us and with whom we stand in no relation is an empty notion" (page 295). It is an artificially conceived ideal which has no roots in the rich loam of daily experience. Its impracticality is the reverse face of its sentimentality. It is something imagined, a product of thought. But "*ein Gedachtes kann kein Geliebtes sein.*" Social and political stability is the base from which ethical excursions are to be made. Rules of morality are not to be derived from alleged principles of absolute justice but from the social practices enshrined in tradition and the state. It is obviously political considerations, which make Hegel say of Christ's injunctions that many of them

> are opposed to the primary foundations of bourgeois society, to the fundamental principles of the law of property and of self-defence. . . . A state that made the attempt to live up to the commandments of Christ would go to pieces [p. 41].

In a later manuscript—*Kritik der Verfassung Deutschlands*—Hegel makes short shrift of those who would seriously subordinate public law to private morality. Both individual law and private morality have their ground, nature and limits in the life of society and the state. How differently he speaks when he is discussing the relationship between individuals in a state which has *Wirklichkeit* and when

he is describing their relationships in a state which merely has *Existenz!* All rights are based on *interests*[36] and all interests flow from social differentiations within the state. The chief interest of the state is interest in its self-preservation. *Moralisten* and *Menschenfreunde* are contemptuously spoken of as "men without country or interest." In denouncing politics as an art in which expediency was the only recognized principle, they were really undermining the basis of whatever peace and order existed. If *every* right is based upon some interest, why should the state whose interest lies in self-preservation be regarded as immoral in enforcing *its* right? There is no right so pure that we cannot discover the interest out of which it grows. Conflicts of rights are conflicts of interests. Only in so far as the latter permit of settlement, can the former be adjudged or resolved. Conflicts of interest, however, are not necessarily resolvable. That is why appeals to abstract ethical rights—presumably universal and objective—are hollow. Where there is a collision of rights then we must look to "war or whatever else it may be to decide not which of the rights maintained by the conflicting parties is the valid one—for both are valid—but to decide which right must give way to the other. War must decide this because both contradictory rights are equally valid" (p. 101).

In Hegel's published writings these Hobbesian tones are skillfully blended in a metaphysics of history which seeks to show that the actual outcome of war is already contained in the logical notions of the real, the right and the reasonable. A double motive which is productive of considerable ambiguity runs through the discussion. This arises from the conflict between Hegel's natural *Realpolitik* and his supernatural metaphysics. The first position is advanced against

[36] *Schriften zur Rechtsphilosophie und Politik*, Lasson ed., 1913, p. 100. The essays and manuscripts published here throw a significant light on the development of Hegel's philosophical views.

adherents of the natural-rights doctrine, who desire to achieve political power; the second is offered to them as a consolation for not getting it. The general argument runs briefly somewhat along the following lines.

Any criticism of the world on the basis of what ought to be is easy enough. Everyone can give hints to the Creator how the world may be improved. But in view of the fact that no two people urge the same system of improvements, some objective standard of the "better" is necessary. Only that is really better which is continuous with some existing thing already recognized as good. We cannot start *de novo* as if the world had no history and as if the men to whom we appeal could change their nature merely by taking thought. All who come proclaiming new theories of what ought to be, Hegel greets with a "*Hic* Rhodus, *his* saltus" (*Rechtsphilosophie,* "Vorrede"). Possibilities must be grounded in the nature of the actual. Then, his opponents retort, at least there *are* possibilities. Hegel cheerfully grants this in his rôle of political statesman analysing a situation *before* its history is made. The actual, never the specific "ought to be," determines the *range* of what "ought to be." As a metaphysician, however, as one interested in understanding and justifying history *after* it has happened, Hegel tries to prove that what *did* happen is what ought to have happened. He then adds to this assertion the even more galling one to the effect that the conflicting conceptions of what should have happened were all necessary to insure the victory of the better conception or of the one that did happen. And the better is known—after the fact—as that which actually happened. *Die Weltgeschichte ist das Weltgericht.* The only difficulty is that on the basis of his metaphysics Hegel has no right to argue against those whose politics he despises, while in behalf of his immediate politics he has no right to claim the support of his metaphysics.

All his life Marx like Hegel was compelled to take a stand against abstract ethical idealism, not only as a consequence of his social theories but as a necessity of revolutionary practice. In every country eloquent voices were preaching a new social evangelium in the name of justice, love and brotherhood. Weitling, Feuerbach and the *wahre Sozialisten* in Germany, St. Simonians and Proudhonians in France, Owenites and pre-Raphaelities in England, Christian Socialists everywhere—were making impassioned pleas for social reform. All the saints and rebels in the calendar of history were invoked in appeals to such diverse things as conscience, reason, mercy, social consciousness and God. Even avowed revolutionists like Bakunin and Mazzini formulated their demands for social change with cries for liberty and self-determination. And most significant of all Marx was compelled in 1875 to criticize the platform of his own political party for demanding "the full product of one's labor," "just distribution" and "equal rights." He characterizes these expressions as meaningless and hollow phrases.

In combating the excesses of ineffective and sentimental "moralizing" Marx leaned so far backward that, soon after his death, the myth became current that he had no place for any ethics in his philosophy of social activity. This is associated with a narrowly mechanical theory of social causation also usually attributed to him. Both interpretations are profoundly in error. For Marx no social life is possible without human consciousness. And there is no characteristically *human* consciousness without ethical ideals of some kind. But Marx went on to inquire what the source of these ideals is, when, why and where they change, and what provided relative justification of any ideal in the present. He does not deny the reality of ideals in seeking to explain their social basis. Nor does he deny their normative character in

grounding them on human need. He differs from all whom he criticizes as Utopian not in that he has no ethics but in that he has a *naturalistic* ethics. And he departs from the disguised Machiavellian ethics of Hegel and the Hobbesian morality of latter-day social Darwinists—which are both in essence naturalistic—in that he has a *revolutionary* ethics. Against the abstract morality of Kant and Christ, Marx held that ethics represents a series of demands, not a series of demonstrations or intuitions. His ethics is a class ethics. The ethics which were opposed to it were also, he maintained, class ethics. Peel their pseudo-logical husk away and the kernel will be found to be a concrete class need. It is inevitable that each class consider its ethical demands as absolute: it is not inevitable that it pretend that these demands are impartial or universal. Behind class rights are class needs.

In *Capital* Marx speaks continually of the "exploitation" of the worker's surplus labor-power, *i.e.*, that part of his working-day for which the worker receives no equivalent. He refers to it as booty, robbery and embezzlement.[37] And it is a justifiable characterization—from the point of view of the worker. But the latter cannot *prove* his rights, he can only *enforce* them. He attempts to enforce them, however, against those who not only have a legal right to what the worker claims but, from the point of view of their class needs, a moral one as well. Tradition, religion, ethical use and wont stand behind them. There is no appeal to a "higher" ethical standpoint from which conflicting class claims can be settled. And that is all Marx meant when he proclaimed that he never appealed to justice or absolute morality. Class claim opposes class claim. One must give way.

[37] *Capital, passim,* especially I, 259, 583, 653, 649, 670.

The capitalist maintains his rights as purchaser when he tries to make the working day as long as possible. The laborer maintains his right as seller when he wishes to reduce the working day to one of definite normal duration. There is here, therefore, an antinomy, right against right, both equally bearing the seal of the law of exchanges. Between equal rights force decides. Hence it is that in the history of capitalist production, the determination of what is a working day, presents itself as the result of a struggle, a struggle between collective capital, *i.e.*, the class of capitalists, and collective labor, *i.e.*, the working class [*Capital*, I, 259].[38]

Morality, then, for Marx is natural. He therefore rules out any ethics based on divine revelation. Morality, he adds, is social. And all mystic and purely personal intuition about the nature of "the good" and "the better" must go by the board. Morality is active. Marx is consistently bitter against the religion of suffering and the duty of forgiveness in all of its numerous Christian forms. Morality is based upon needs, upon what man as a social creature desires. These desires are determined as much by man's *class* relationships as by his original nature, whatever that may be.[39] For Marx all ethical systems which presuppose a scale of objective values—of values that are above the battle of class and party—are direct or indirect disguises which mask the hidden interests of one of the contestants. Health, leisure, education, truth, beauty, etc., may appear to be objective values, since all classes seem to strive for them. But they have a different content and meaning for different classes. Once ask, "*Whose* health is valuable, *what* kind of leisure and education is to be encouraged, *when* is truth-speaking a value," and in a class society the answers will reveal a class standpoint.

[38] For a rediscovery of the logic of the situation in a concrete way, see J. H. Tufts's experiences as chairman of a board of arbitration, related in *Contemporary American Philosophy*, New York, 1930, II, 342.
[39] *Dokumente des Sozialismus*, III, 265.

Class morality for Marx is rational when it is aware of its own irrational roots. It is evolutionary because those roots have a growth and a history. It defines its good in relation to class needs. The nature of class needs obviously depends upon the nature of the environing world. Since the latter is constantly changing, the concrete moral demands of the class change. Sometimes it is a demand for greater freedom, sometimes for power: sometimes it shows tolerance, sometimes intolerance. There are no fixed needs nor final values. The "ought-to-be" is never identical with "what-is." But yet it is a temporal function of "what-is." The ethics of Marx did not merely express a demand for social justice but a specific *kind* of justice dependent upon the objective possibilities created by capitalism. And since, to repeat, every ethics is basically a series of demands and not a series of demonstration, Marx's ethics was a *fighting* ethics. The only thing eternal about morality is man's desire for the better. But what the "better" is, time and circumstances redetermine from situation to situation. That is the moral of Marx's denial of the theory of natural rights.

Communists do not preach morality [wrote Marx in his biting criticism of Stirner's petty-bourgeois anarchist heroics]. They make no moral demands upon people such as "Love one another" or "Do not be egoistic." They know very well that egoism as well as sacrifice under certain circumstances are necessary forms of individual assertion.[40]

3. *The Centrality of the Process in Hegel and Marx.*

Hegel's system has been characterized as a philosophy of evolutionary idealism. It was not evolutionary in a biological sense. That was a doctrine which Hegel had decisively repudiated when it had first appeared as a suggestive intima-

[40] *Dokumente des Sozialismus,* IV, 215.

tion in the writings of his romantic contemporaries.[41] His philosophy was evolutionary in a historical sense—but historical, as we have seen, with time left out. The result was an abstract scheme of what had actually evolved in the course of natural and human history, translated into the language of logic and shifted to an ontological plane. In this logic nothing could be understood in its bare immediacy. Nothing was self-evident. Nothing was independent of anything else. A meaning could only be grasped in relation to some meaning (or system of meanings) which it implied and which implied it. In effect, if not in intent, what Hegel did was to dissolve all things into their relations, construe these relations as logical categories and present the interrelationships of the logical categories as a process. The order of the logical development of ideas in this realm of abstraction was the same as the order of the succession of events in history. To establish even a semblance of plausibility for his view, Hegel was compelled to introduce and work over into his system a tremendous amount of cultural material. Religion, art, politics, law, history and the natural sciences had to illustrate his metaphysical principles. It was with good reason that Engels referred to him as the most encyclopedic mind of his day and that later generations are beginning to see him as the *grosse Geistesempiriker*.[42] In all of these fields Hegel strove to show that the process was more fundamental than the substance or body of subject matter at any definite moment. He tried to reveal how principles of construction and interpretation arose from the processes at work; how as a consequence of the activity of these principles, the subject

[41] *Encyclopedia*, Sec. 249. Although regarding nature as a system of levels, he holds that metamorphosis is a purely *logical* concept; and that to apply it to the actual development of plants and animals from lower forms is quite fanciful.

[42] See Engels' review of Marx's *Introduction to Critique of Political Economy* reprinted as an appendix in the Duncker edition of Engels' *Feuerbach*, 1927, p. 119. The phrase, however, is Plenge's.

matter to which they were applied was gradually transformed; and how these principles became embodied in a different subject matter out of which new principles—wider in connotation, richer in denotation, and truer in interpretation—evolved. All of this presented not in terms of empirical history but in the language of logical myth.

The recognition of the primary character of change, process and development on every plane of existence appears even more strongly in Marx's philosophy than in Hegel's. For Hegel, the process was cramped by his system. Change was the form in which an unchanging absolute exhibited itself. And since the Christian Germanic Empire was the closest embodiment of the absolute, history was arrested in Hegel's own time. Even as a Young-Hegelian, however, Marx would have none of the absolute. The system *was* the process. With Bruno Bauer he made the principle of *Negitivität* central in Hegel's exposition. With Bauer he said, "The Absolute is not Substance but Subject." Activity and power are prior to matter and structure. All apparently self-included existence is a mode of logical activity. Logical activity is the all-including process. Later, when as a result of his attempt to understand the nature of the *historical* process Marx was compelled to abandon his idealism, he still retained his belief in the underivable character of activity. But it was now a *natural* activity, not a logical activity. It was the activity of matter, not of spirit. Every existing thing had a place in a material continuum of directed movement. The logic of Hegel received a naturalistic foundation. Nothing could exist outside of this continuum of directed movement. Nothing could be understood except in terms of the logical relations of this continuum. In different ways this holds on every level. That which appears to be immediately given to sense perception is revealed as a mediated product of the process of human sensory activity. The character of the his-

torical present is shown to involve the past and to suggest the future. The "perfect" state of Hegel is viewed not only as the end term of a historic process but as the first term in a contemporary one which is certain to dissolve it. The independent object of theoretical political economy—the commodity—is shown to involve a definite dependence upon a whole complex of social, historical and ethical presuppositions. Everything which is *given*—be it the price of a commodity, a system of morals or a style of art—has at some time been *produced.* That is what in the first instance the dialectical method of Hegel meant for Marx. He says of it in *Capital,*

> In its rational form it is a scandal and abomination to the bourgeoisie and its doctrinaire spokesmen because it includes in its positive understanding of the existing state of things at the same time an understanding of its negation, of its necessary disappearance; because it regards every historically developed social form as in a fluid movement, interpreting it from its transitional side; because it lets nothing impose on it and is in its essence critical and revolutionary [*Capital,* I, 26, Aveling's translation, slightly revised].

This does not mean, as some critics imagine, that Marx was so much interested in the flow of existence that he neglected the analysis of the formal structure of what flowed. Indeed, that was what Marx conceived his life work to be—an analysis of civic society (*Bürgerliche Gesellschaft*) whose anatomy he discovered in political economy.[43] He described the anatomical structure of civic society exhaustively enough, but his most distinctive contribution was to show that the very anatomy of society—*i.e.,* political economy—was not a frame upon which and within which the body politic was built up, but that it was the gradual product of the social relations into which men entered, that it was modified

[43] *Introduction to Critique of Political Economy,* English trans., p. 11.

by these relations and modified them in turn. It was Marx's merit to show that just as a good anatomist must know more than anatomy, so a good economist, in order to have real insight into the nature of the surface relationships which constitute the "science" of political economy, must know more than political economy.

4. *End in Hegel and Ends in Marx.*

The attempt commonly made to read into Marx an economic fatalism necessitates some consideration of the nature and function of ends in his philosophy. Here again his relationship to Hegel has been misunderstood.

In Hegel the developmental process is of necessity teleological. For there is only one process, one systematic whole in which everything moves and has its being. Just as the organism as a whole is involved in the functioning of any one of its parts, so the universe as an organic whole is involved in the structure and activity of every finite entity. And if the systematic structure of the whole be regarded as the realized *end* of the process, then any of its aspects may be regarded as the means by which it is realized. As a means it is not something extrinsic and external to the end, as when we say that the hammer is the means by which we drive the nail fast, but something intrinsic or internal, a part of the end, as when we say that the blood is the means by which the body is built. The end is in the means as much as the means in the end. For example, from the point of view of the state as an organic totality (on a relatively incomplete level), the individual citizen is a means to the whole. His nature, worth and status are evaluated in respect to the end, *i.e.,* to the idea of the state. His personality is realized through the state and as an ideal man (*i.e.,* not as animal or angel) he can no more be separated from the state than can

a mathematical point from a line. The state, on the other hand, is also a means to the expression of the ideal personality of *all* its members. The same logic holds for the whole universe. Everything is both means and end to everything else. The universe is through and through purposive.

In Marx the developmental process is purposive only where the social categories of the material continuum are involved. Processes that are purely physical, like the movement of the waves or the heavenly bodies, are neither constituted nor explained by desire, want or purpose.[44] *Social* movement very definitely involves reference to volition. Volition depends upon two sets of relations: relations between nature and man; and relations between man and man.[45] In either case the point of departure is human need. It is human need expressed as purpose which splits the one Absolute Whole of Hegel into pieces. Not into a friable mass of atomic units as in sensationalistic empiricism but into several well defined wholes. The earth, for example, is a whole for the geologist. It is a different whole—although related to the first—for a man in quest of nourishment. It is a still different whole for the economist seeking to discover the laws of rent. The kind of whole we have depends upon the kind of purpose we have. This is apparent even in the type of objects human beings construct. The natural object (as distinct from thing), the esthetic object, the ethical object, the economic object are in a sense *objectifications* of human purpose. Purpose is not creative but rather selective, for we can always significantly examine purpose as created by other elements which are not purposive in the same sense.

This supplies the key to Marx's conception of purpose. The process of social development has no ends to realize which

[44] It is interesting to note that Hegel uses *Bedürfnis* and *Trieb* as illustrations of *Zweck*. *Encyclopedia*, Sec. 204.

[45] *Deutsche Ideologie*, *Marx-Engels Archiv*, 1926-27, I, 254.

are not the ends willed by men. But those ends are not realized merely because they are willed by men. *What* is willed must be continuous with a discovered situation which is not willed but accepted. *When* it is willed must be determined by objective possibilities in the situation. Only when these conditions are fulfilled can the ends willed by men be realized. Only, for example, when the process of production has been sufficiently developed to permit of mass manufacture can socialism, as an end willed by the proletariat, be realized. And only when the consequences of mass production under capitalism produce widespread *need* is socialism effectively willed. Marx's theory of social activity sees in the presence of need the explanation of why socialism is willed at all; and in the presence of certain objective conditions why what is willed will probably be realized.

Need gives man strength; he who must help himself will do so. The real situation of this world, the sharp opposition in modern society between Capital and Labor, Bourgeoisie and proletariat, which stands out most clearly in industrial relations, serves as the other powerful generating source of the socialist outlook, of the desire for social reform. These circumstances cry out: "Things cannot remain that way, they must become different and we ourselves, we human beings, must make them different."[46]

Needs develop as objective conditions develop. They are at the base of those objective possibilities which human beings strive by *action* to realize. The logic and pattern of social development is determined by a triadic, interacting relationship between objective environment, human need and class activity.

Like Hegel, Marx never dissociated man from his social environment. In speaking either of man or man's environment there is always an implied reference to the *other* term

[46] *Aus dem literarischen Nachlass*, II, 416.

in the relation. Both make one interacting whole. Often, however, Marx refers synoptically to the development of this interacting whole without stopping to point out how these elements are specifically related and how they operate. Man's ideas and purposes are immanent in the process. Their immanent character appears more clearly when we examine the rôle they have played in the past than when we examine our own ideas in the flush of the present. Even religious ideas and theories which profess to hold up transcendental standards of the true and the good express some aspect of the immanent social process. Nor did Marx ever pretend that his own theories were more than the expression of an existing class struggle, that they were valid outside of the historic context in which they were generated. It is in this sense that we are to understand his oft-repeated assertion:

> We do not set ourselves up against the world in doctrinaire fashion with a new principle: Here is the truth! Here you must feel! We develop new principles of the world out of the principles of the existing world. We do not proclaim to it: Cease from your struggles! they are silly; we will tell you what to fight for. We only show the world what it is that it is really fighting for; that consciousness is something which it *must* acquire even against its will.[47]

The function of a social theory is to bring human beings to self-consciousness, not the mystical self-consciousness which for Hegel was the end of all history but a class consciousness arising from concrete needs.

Social needs and purposes are not subjective. They are as genuine a part of the objective milieu as the classes themselves. The theories and ideals to which those needs give birth are *forms of response* to the existing scene. They must be brought to consciousness in order to function effectively. Here we have a critical social behaviorism which does not

[47] *Gesamtausgabe* I, 575. Letter to Ruge.

deny that human beings are influenced by beliefs but which seeks to make intelligible the historical impact of dominant social beliefs—their rise, acceptance and decline—by interpreting them as forms of class behavior. For Marx all social theories including his own are not hypothetico-deductive systems seeking to formulate objective and eternal truths. They are social judgments of practice. They are methods of making history. Marx's method is "truer" than others because it is more effective. To counter by saying that it is more effective because it is truer is to utter a proposition that can never be tested without reference to further effectiveness. The theories of the communists are projections of a class will enlightened by knowledge of the conditions and historical antagonisms which have produced class divisions. "They serve," declares the *Communist Manifesto,* "merely to express in general terms the concrete circumstances of an actually existing class struggle; of an historical movement which is going on under our very eyes."

With this emphasis on the rôle of class consciousness in the historical process, we reach that specifically dialectical aspect of Marx's thought which best shows what he owes to the Hegelian dialectic.[48] It is only by appreciating the dialectical nature of class consciousness, that we can understand the concluding sentence of Engel's *Feuerbach:* "The working-class movement is the heir of classical German philosophy."

III

The Dialectical Method in Hegel and Marx

A witty Frenchman once said that Marxism like Christianity has its bible, its councils, its schisms; its orthodoxies

[48] Compare in this connection Lukać's interesting book on *Dialektik und Klassenbewusstsein* (1923), which does justice to the dialectical aspect of Marx's thought at the expense, alas, of Marx's *naturalism.*

and heresies; its exegeses, profane and sacred. And like Christianity it has its mysteries of which the principal one is the dialectic! It seems to me, however, that if Marx's dialectic has remained a mystery to his critics, the reason has been that they did not know where to look for its solution. They took his metaphors about turning Hegel's method right side up too literally. As if a method can be studied in the way we test a sow's rump! The life of a method lies in its application. Only in application can its meaning be truly grasped. Too often, however, have critics stopped at passages—especially in *Capital*—to muse over the "deeper meaning" of a Hegelian terminology which Marx, by his own confession, had taken over in a spirit of coquetry. The influence of Hegel's dialectical method on Marx was indeed profound; but it is not to be ferreted out of the formulas for the commodity or money cycle—C-M-C or M-C-M. It must be construed from his actual intellectual procedure—from his economic and historical analyses.

The least significant aspect of the dialectical method is its division into triadic phases. Although there is a historical tradition behind the idealistic dialectic which carries the "triad" at least as far back as Proclus, it is not logically essential to the method. Psychological and religious (Christian) motives have played a part in keeping it focal among idealists. It is not so much the number of phases a situation has which makes it dialectical but a *specific relation* of opposition between those phases which generates a succession of other phases. The necessary condition, then of dialectical situation is at least two phases, distinct but not separate. The sufficient condition of a dialectical situation is given when those two phases present a relation of *opposition* and *interaction* such that the result (1) exhibits something quali-

tatively new, (2) preserves some of the structural elements of the interacting phases, and (3) eliminates others.

1. *Defects of the Dialectical Method in Hegel.*

In a letter to Dietzgen in 1876, Marx writes of Hegel what he had earlier written to Engels and to Kugelmann:

> When I have shaken off the burden of my economic labors, I shall write a dialectic. The correct laws of the dialectic are already included in Hegel albeit in mystical form. It is necessary to strip it of this form.[49]

What does Marx mean when he speaks of the dialectical method in Hegel as mystical? On the basis of our earlier discussion, his position may be briefly summarized. (1) The dialectical method in Hegel is mystical because it seems to generate out of its own ghostly activity the very subject matter to which it is applied or in which it operates. It involves the familiar and inevitably futile attempt to deduce existence. "Hegel fell into the error of considering the real as the result of self-coördinating, self-absorbed, and spontaneously operating thought."[50] (2) Mystical again is the dialectical method in Hegel because it is used as an instrument to establish the logical structure of *one* all-inclusive whole. Strictly speaking this means that all of existence becomes relevant in considering the nature of any part of it. From which it follows that piecemeal knowledge is impossible; since if everything must be known before anything can be known, nothing can be *adequately* known. Short-time action cannot be reasonably grounded. The absolute whole together with the dialectic in its Hegelian form is simply not *relevant* to finite purpose, convenience or need. For Marx

[49] Josef Dietzgens' *Sämtliche Schriften*, 3d ed., 1922, I, 166.
[50] *Introduction to Critique of Political Economy*, p. 293.

there are wholes not *the* whole. (3) The third respect in which the Hegelian dialectic is mystical is already involved in the above. It is unable to explain the detail mechanisms of the activities which it purports to describe in *ad hoc* fashion. It offers no clue to empirical approach or control. History is an illustration. The dialectic method assures us that spirit will realize itself. But it does not tell us when, where and how.

2. *Dialectic as the Logic of Totality in Marx.*

Once the Hegelian dialectic is freed from its mystical form, its place and importance in Marx's methodology appear sharp and clear. For purposes of exposition it is necessary to distinguish between the influence of the category of "*totality*" on Marx's thought—which corresponds to the static aspect of the Hegelian dialectic—and the category of "*activity*" which reflects its dynamic aspect. The notion of an "active totality" in Marx differs from the "absolute whole perpetually renewing itself" in Hegel in that the Marxian totality is social, and limited by other totalities, while the Hegelian totality is metaphysical and unlimited.

For Marx as for Hegel the social system constitutes a whole. Its various cultural aspects—educational system, religion, art—are parts of the whole. The real character of any one of these aspects cannot be grasped when we isolate it from the context of tradition and living energies which define the culture of an age. A system of law, for example, can only be understood in the light of its function in relating different social activities such as the economic relations whose character substantive law expresses, the ethical practices of the community whose ideals it seeks to incorporate, and the political mechanism of repression and control whose stability it tends to sustain. But the nature of the whole is

such that it cannot be studied *as a whole* any more than the physiologist can study the human body as a whole. We must begin with a tentatively isolated part. In order to understand the part, however, we must go on to other parts. As we extend our investigations and as the relationships which the part has to the whole become clearer, we are compelled to modify our original conclusions about the nature of the part when it was considered in relative isolation. Whatever we know about the hand or the eye as a consequence of analyzing its structure in isolation assumes a different significance when it is studied as an instrument of the organism as a whole. The mutual determination of function and structure becomes intelligible only from the point of view of the whole system. This involves a continual revision of our knowledge as it goes from part to part until the systematic nature of the whole is revealed. The development of knowledge, in the language of Hegel and Marx, is from the abstract to the concrete. The part is an abstraction, the whole is concrete. In the social disciplines this insight has now become almost a commonplace. It is well known that a history of religion or of theology merely in terms of the doctrines which men have believed does not possess the same degree of intelligibility as a social history which shows how these religious beliefs were bound up with other aspects of the culture-complex. This was the nub of Marx's criticism of Feuerbach's psychological interpretation of religion. It is even more obvious that the same logic holds for the structural relationship of any specific subject matter, e.g., political economy. The analysis of the "economic cell-form" of capitalist production—the value form of the commodity as discussed in the first volume of *Capital*—must be modified by the analysis of the body of "capitalist production as a whole"—as discussed in the third volume.

It is just at this point that the categories of Hegel's doctrine of Essence appear prominently in Marx. The nature or essence of the system studied does not exist behind or beyond the appearances but is expressed in them. The whole exists in its parts; the parts in the whole. The contingency of the initial starting point is rationalized by the insight into the necessity of the organized whole; the necessity of the whole appears in the contingency of all possible starting points. For Hegel and for Marx, whole and part, necessity and contingency, continuity and discontinuity, are polar categories —one term cannot be intelligibly used without the other. The material and formal elements in the natural process, the active and the passive factor in the historical process, capitalist and proletariat in existing society—all are inseparable distinctions within organized wholes whose continuous existence demands the presence of both. So long as we at any given moment preserve the structure of a differentiated whole, it is impossible to accept the consequences of one of the polar categories and to reject the consequences of the other. Just because "the relations of production of every society constitute a whole,"[51] it is impossible to eliminate the periodic crises, the unemployment and mass of proletarian misery—that is, the *bad* side of production, and still retain *on the same plane,* the laissez-faire philosophy of operation which provides an open field for talent and initiative—that is, the *good* side. The bad and good are opposite faces of the same situation. Just because the capitalist in virtue of his position *must* produce for profit, "he ruthlessly forces the development of the productive powers" (*Capital,* I, 649), and lays the material foundations for a different society. The principle of polarity discloses the *structural opposition* of whatever has systematic unity.

[51] *Poverty of Philosophy,* English trans., p. 120.

3. *The Dialectic as the Principle of Activity.*

So far we have considered the principle of dialectic as it applies to a system at rest. But the system which Marx was analyzing was a *social* system in *movement*. The logic of *coördination* must be modified by the logic of *succession*. The whole at rest must be regarded as a limiting case of the whole in movement. The key to the development of a whole is to be found in the specific character of its structural opposition. At any given moment, the structural opposition must be such that its mutually supporting elements are *not* of equal strength. The elements within the structure interact upon one another in a way which threatens to upset the precariously established equilibrium which appeared at first analysis. In this tendency to disturb the equilibrium one can recognize incipient development. Gradually there results a qualitative change and equilibrium is again restored. The extent, the strength and the rate of interaction between the polar elements within any situation depend upon the specific factors involved. They cannot be *deduced* from the general formula of dialectical movement. That means that the equilibrium which is analyzed in the present cannot be regarded in complete independence of the equilibrium which preceded it; and that it already contains within itself indications of the general character of the equilibrium to be realized in the future.

Formally, the dynamic aspect of the dialectic method may be presented in abbreviated fashion as follows:

(1) *The Fluidity of the Fact.*—If logic is to be relevant to existence it must do justice to one of the fundamental characters of existence, viz., movement and flow. "The object," writes Hegel, "is in its essential nature movement."[52] The analysis of its nature, then, will consist in distinguishing

[52] *Phänomenologie des Geistes,* Lasson ed., p. 75.

the various phases of an object as integral moments of a process, and unifying them in some synoptic concept. In our analysis we begin with concepts and meanings that are fixed and unchangeable. But how can these meanings which are constant and timeless be significantly applied to an existence which is variable and temporal (for Hegel read "finite")? Meanings must develop with the objects of which they are the meaning. Otherwise they cannot be adequate to their subject matter. The retort comes that meanings cannot develop at all. By *definition* they do not change. When we speak of the development of meaning we mean the succession of *new* meanings. None the less the situation is not altered by regarding every development in meaning as a *new* meaning. For first, the old meaning is included in the new, and secondly, the series of meanings which are generated by the subject matter in question are knit together by a *qualitative unity* which distinguishes them from all other series. For example, we may define capitalism, with our eye on the seventeenth century, as a system commodity of production which arises whenever labor power appears on the market as formally free. Yet as we analyze the developmnt of the capitalistic system through the industrial capitalism produced by the technological revolution in the eighteenth and the nineteenth centuries, and the financial capitalism of the twentieth, we enrich the significance of the meaning of capitalism by including the various phases through which it has passed as differentiated aspects of the same *type* of social organization. We study slavery and feudalism in the same way but do not confuse the continuities established in our investigation by distinguishing between the three different *types* and redefining them in relation to all available material.

(2) *The Logic of Development.*—Every meaning has an

objective reference. It is controlled by that objective reference. The discovery of the nature of the objective reference —which in its systematic connection with other things is revealed as a process—gives the meaning a richer connotation. It is invariant only as the unity of the different determinations it includes. No meaning applicable to things is a mere identity. Man is man (A is A) does not tell us the meaning of man. Man is rational (A is B) does. But man is also mortal (C), animal (D), social (E), etc. Man can always be the subject of another predicate. His nature is not something *behind* these predicates but is revealed *in* them. Every one of these predicates tells us something new about man and with each one the *system of predicates*—or the *meaning* of man—changes. Where thinking is relevant to existence we may define a dialectical situation as one in which we are compelled, with the progress of knowledge, to redefine our terms. Since "the *content* of knowledge and the *form* of knowledge are inseparable," says Hegel,[53] the growth of one entails a corresponding growth of the other. And since for Marx the content of knowledge can never be boxed within any closed system, logic itself, as the study of the *order* of things, can never be a finally closed system.

(3) *The Schema of Development.*—The driving force in the development of a dialectical situation is derived from the conflict and opposition of the elements within it. The nature of a thing is disclosed in its relation to other things. Every relation may be viewed from two opposite aspects, *i.e.*, from the point of view of the two terms it relates. Each term regards the relation as internal to itself and the other term as external to itself. An antinomy results which can be solved only by *reinterpreting* the situation and by looking at both terms and their relation from the point of view of a

[53] *Science of Logic*, 1929, I, 54.

wider relation (whole or system). But one antinomy is solved in order to make way for another. Opposition breaks out between the terms on a higher level. It is this opposition which Hegel calls the principle of *Negitivität.*[54] It is the self-moving soul of all physical and spiritual life. Nothing is sacred to it, nothing immune to its negations. It is "*der Geist der stets verneint.*"

Marx's analysis of capitalist society begins with an examination of the actual economic relations in which men find themselves. These relations take the form of opposition between proletariat and capitalist, between the necessities of production and the needs of consumption, between the expansion of industry and the contraction of purchasing power, etc. All of these oppositions constitute a whole.[55] They cannot be solved without changing the whole. At a certain point in the interaction of the opposite elements, the equilibrium is destroyed and reconstituted by human *action.* Marx's *Capital* is a description of the mechanism of production of the objective forces making for opposition. Within it, the dialectical principle appears as class activity.

(4) *The Levels of Development.*—Dialectical resolution of conflict and opposition is the motor power of all development. It is a *productive* synthesis of the conflicting elements within a situation and not a deductive analysis of what both have in common. A true synthesis is more than the logical addition of this *and* that. It is this and that *taken* in a definite way. The *specific* way in which they are taken can never be predicted in advance. For Marx, since the developmental process is temporal, the manner of synthesis depends not only upon the subject matter within which development

[54] "The Negative in general contains the ground of Becoming, the unrest of self-movement," *Science of Logic,* 1929, I, 180; cf. *Encyclopedia,* Sec. 81.

[55] *Aus dem literarischen Nachlass,* 1902, II, 132.

takes place but upon the shifts and realignments of human interests in time. No matter how the specific synthesis may be effected, its general character may be indicated. A genuine synthesis is more than a simple *destructive* process which removes the possibility of further development and conflict (as when a community goes down to a common doom as a result of class struggles). But neither is it a simple *additive* process which by fusing and compromising opposing elements produced a new situation—one in which the original elements can still be discerned and, by some inverse operation, precipitated out again (as when we mix a white sand heap with a black sand heap to get a gray sand heap). Nor is it a simple *transformative* process in which the qualities of the different elements are no longer discernible in the new quality created (as when water emerges from the union of oxygen and hydrogen). Nor is it finally a simple *repetitive* process in which the elements remain unchanged. A dialectical synthesis is all this and more. Thesis and antithesis are resolved in such a way that the pretensions of each to constitute the whole of a relation are *denied;* yet aspects of each are retained or *conserved* in every new whole or situation; and are reinterpreted or *elevated* (*aufgehoben*) as subordinate moments in a more inclusive whole. As Charles Peirce realized, what Hegel is groping to express in this way, is the logic of natural *continuity.*

Hegel alleges this continuity to be purely logical; for Marx it is primarily historical and social. Out of it arises the succession of social systems in determinate order—primitive communism, slavery, feudalism, capitalism and socialism. The necessity of development is natural (on this plane, more accurately, *socio-historical*), not logical. Any two of these stages exhibit the relations described above, e.g., socialism and capitalism. Socialism affirms the social nature

of the productive process under capitalism, denies the anti-social character of its distribution and reinterprets both as the condition under which socialized man uses his knowledge of natural necessity to attain cultural freedom (*Capital,* English trans., III, 954).

(5) *The Rôle of Consciousness in Dialectic.*—In Hegel the dialectical process is expressed not only in the realm of objective spirit but in the realm of nature as well. Indeed most of the illustrations of the natural dialectic which Engels cites in his *Anti-Dühring* and which are so popular in socialist literature are to be found in Hegel's *Logic.*[56] Now there can be no question but that Hegel was justified in terms of his own system in extending the dialectic to nature. Does he not tell us that "self-consciousness and existence" are absolutely one and the same?[57] If they are, then nature as implicit self-consciousness can be legitimately analyzed as a continuous series every term of which is in some sense aware of the subsequent terms within the series. Without this thread of awareness, the relationships within the series would be contradictory. It supplies the principle of unity. Only by virtue of the activity of consciousness can Hegel write a *Naturphilosophie* in which every aspect of the physical world is represented as seeking dialectically to transcend and fulfill itself in the continuous whole whose systematic interconnection is both objective meaning and mind.

That consciousness is essential to the dialectical process in nature is apparent at almost any stage in the succession of the categories in the first two books of the *Logic.* But for

[56] E.g., the development of the plant from seed, through flower to fruit, which serves as Engels' stock illustration of natural dialectic will be found in Hegel's *Logic,* I, 147. How close a student Engels was of Hegel's natural philosophy may be gathered from his recently discovered manuscript, *Dialectik und Natur,* edited and published by Riazanov in *Marx-Engels Archiv,* 1926-27, II, 117-395.

[57] *Phänomenologie des Geistes,* 1907, p. 158.

purposes of illustration we may take his discussion of the category of "limit" (*die Grenze*).[58] Whatever has determinate being must be differentiated from something else. All determination is negation; any something has character because it is not its other. A meadow that had no bounds, a sea that had no shore, would be neither meadow nor sea. A thing (*Etwas*) then must be given together with its limits. Its character may be defined as the negative unity of its limits. But Hegel's problem is, so to speak, to get the thing over and beyond its limits. Otherwise there can be no movement, no development, no dialectical synthesis of the balanced tension between the positive and the negative aspects of every something. How can something transcend its own limit? This can be done only when the something in question senses that its nature is involved in another *possible* something which cannot be *actualized* without destroying its own original limits. Hegel's own language reveals a continual implicit reference to consciousness and the activity of consciousness. When something, he tells us, realizes that its own deeper nature is involved in some systematic whole which extends further than its own limits, than those limits become "fetters" (*Schranken*). They impede self-development and growth. They must be burst. "In order that the limit applying to something in general should also be a fetter, something must pass over into itself beyond the limit; it must referring to itself, relate itself to it as something which is not."[59]

[58] *Logic,* 1929, I, 147.

[59] *Logic,* 1929, I, 145-46. Struthers and Johnson, following McTaggart, unfortunately translate *Schranke* by "barrier" instead of "fetter." The problem which puzzled McTaggart as to why Hegel should contrast "the ought" of Something (*das Sollen*) with its limit as fetter (*die Schranke*), and which he solves by introducing Hegel's desire to score on Fichte, seems to me to be better illuminated when we emphasize the spiritual presuppositions of the whole dialectical process. If all

To a naturalist who denies that nature is implicitly spirit, the above must sound like sheer mythology. Yet it needs only to be translated out of its technical jargon and illustrated with examples drawn from the proper fields in order that its profound insight be apparent. The proper fields from a naturalistic point of view would be psychology and sociology. We may briefly mention the development of personality and the growth of social institutions as illustrations of what Hegel means. The development of personality can be understood as a process of overcoming the obstacles which have been created by past achievements—achievements which are as genuine an expression of personality as the effort necessary to prevent them from cramping and routinating new experiences. The growth of institutions may be described as a process of liberation from the restricting influence of rules and principles which at an earlier time were essential for proper functioning. Wherever we protest that means have become goals, that the forms of justice have become the ends of justice, that the letter killeth the spirit, the situation presents the pattern unfolded in Hegel's discussion of the limit.

Marx is a naturalist. Spirit is not the source of matter but rather its highest product. And since the social is primary to the individual psyche, the dialectical relation is primarily a social relation. Its syntheses must consequently always be effected by human *activity,* for the human will is part of the social whole. Within this whole the moments of opposition are the objective conditions (*thesis*) which are independent of immediate consciousness (but not of history) and the human needs and desires (*antitheses*) which project possi-

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being and existence is implicit self-consciousness, then all their modes must literally *strive* to transcend their partiality. Striving is only possible when there is something to be overcome. What is to be overcome is the "fetter"—the past progress which stands in the way of present progress.

bilities on the basis of those conditions. At a certain point, as a result of the pressure of objective conditions on the will and thought of a definite class, action (*synthesis*) results. An attempt is made to actualize the objective possibilities generated by the interaction of the social environment and human needs. By means of class action the "moments of opposition" are transformed into "phases of development."

It is clear, then, that consciousness is an integral part of the social process. It is amazing that critics should have overlooked the place and function accorded to class consciousness in Marx's thought. Perhaps the explanation is to be partly found in the fact that the emphasis upon the presence and efficacy of class consciousness shifts gradually from explicit assertion in *Die Heilige Familie* to implicit statement in *Capital*. In the latter work Marx is primarily interested in analyzing the mechanism of the social system which produces the *conditions* of revolutionary class consciousness. There can be no consciousness without mechanism and no social mechanism without consciousness. In none of his writings does he withdraw from the position he took in earlier philosophical works. His historical writings illustrate concretely,[60] the abstract propositions already formulated in *Die Heilige Familie*, where he considers the factors which drive the proletariat to a realization of the inhuman character of its existence.

The proletariat senses in its position in society its own destruction, becomes aware of the character of its inhuman existence and of its own helplessness. To use a phrase of Hegel's, in this infamy it is the expression of indignation against infamy, an indignation to which it is necessarily

[60] It is incomprehensible on purely logical grounds that those critics who have so much to say about Marx's fatalism should neglect his historical writings, especially *The 18th Brumaire of Louis Napoleon* and *Class Struggle in France 1848-50*, in which the Marxian theory of class consciousness finds definite application.

driven by the contradiction between its human nature and the living conditions which represent the crassest, most inclusive and decisive negation of that nature. Private property abolishes itself only in so far as it produces the proletariat *as* a proletariat, whose physical and spiritual misery becomes conscious misery, and which in becoming conscious of its inhuman condition succeeds in abolishing it.[61]

(6) *The Criteria of Dialectical Thinking.*—If the dialectical process controls dialectical thinking and action, what are the criteria enabling us to determine whether we have thought validly and acted properly? *Formally* we may answer in terms of the category of *coherence.* Only when that whole or unit or continuity which has been destroyed by the presence of conflicting factors has been restored or reëstablished in another whole (or resting point) can we claim validity for our procedure. All thinking as well as the need for all philosophy begins, says Hegel, "when unity has disappeared from the life of man, and when its oppositions, having lost their vital relations and interactions, assert themselves as independent."[62] We go on from whole to whole by bridging the gaps which come up in our experience and integrating external relations into an ever larger systematic unity. And where, short of the absolute, do we stop? From a *finite* point of view Hegel admits that the process comes to completion whenever the finite purpose of our inquiry is satisfied. But as distinct from his naturalist followers he insists that all logical purposes must themselves be systematically unified and that the dialectical relation between different purposes drives us to the one all-embracing purpose of absolute self-consciousness. Marx refused to admit that all the purposes and needs of inquiry constitute an organic sys-

[61] *Nachlass,* 1902, II, 132, freely translated.

[62] "Differenz des fichteschen und schellingschen Systems," *Werke,* 1832 ed., I, 174.

tem, that there is any absolute whole under which they can all be subsumed. As a naturalist he holds that there is no limit to the series of *new* purposes generated by the fulfillment of past needs and desires. What logically unites Hegel and Marx here is the belief that the *specific criteria* of correct thinking must vary with a developing subject matter. Hegel is always looking away from the finite standard to the self-certifying absolute One; Marx is content to remain on the ordinary level of experience and examine each standard on its own claim. But both deny that standards are given once and for all time. They are to be tested by the subject matter to which they are applied. Only because they are continuous with their subject matter can standards be significantly applied at all. Standards have histories. In their development they are evaluated by other standards which are themselves conditioned by different subject matter and purpose. Hegel in a sense would have agreed with Ranke's dictum *"Aus Absicht und Stoff entsteht die Form."* He leaves no doubt that the forms of knowledge in finite experience show a definite growth.

The standards of testing change when that whose criterion the standard was supposed to be, no longer remains in the course of testing what it was. The test is not only a test of knowledge but of its standards as well.[63]

Hegel emphasized the relativity of our evaluating categories in order to point to the necessity of an Absolute which swallowed them all; Marx did so in order to win the possibility of new institutional activities in a changing world. "Categories are historical and transitory products," Marx urges against Proudhon. Quite so, answer the formal philosophers, but these are only social and economic categories. Surely they cannot be the categories of thought itself by vir-

[63] *Phänomenologie des Geistes,* p. 61.

tue of which we distinguish the changes in the categories of other phenomena. But from the standpoint of Marx's evolutionary naturalism (dialectical materialism) the categories of thinking must develop together with the generic traits of the existence which is thought about. "Der Denkprozess selbst ein *Naturprozess* ist," he writes.[64] As a natural process it is comparatively invariant in relation to the process of social and economic change. But with the gradual change in things and the increasing complexity of the organ of thinking, new forms of thought are produced. Standing in the present, we necessarily regard our categories as invariant for all time. The history of thought shows, however, that man has been driven from one invariant to another until the only thing that he can declare invariant for all time is the barest, formal logical relation. To hold that the logic we know is invariant for all possible existence is to utter a proposition which we cannot test, for the very meaning of "all possible existence" depends upon what we discover actuality to be. For Marx any material which is the object of man's activity generates its own normative ideals in relation to the way it succeeds in fulfilling human needs. From the reciprocal influence and interaction between the ideal and the actual a new subject matter is produced out of which in turn are born the means by which it will be changed. This is the heart of the dialectic.

4. *Dialectic as the "Algebra of Revolution."*

It is in the field of history, however, that the principle of dialectic becomes vitally relevant for Marx. It is in relation to history that it has been significantly called the "algebra of revolution."[65] Through *class* consciousness society attains

[64] Letter to Kugelmann, July 11, 1868.
[65] By Herzen, I believe.

self-consciousness. Consciousness implies activity. As a result of the activity of class consciousness the interacting social whole becomes transformed. The class is the subject of the historical process, the carrier of the transformative principle. The social environment is the object of the historical process, the matter transformed. In changing the historical object, the subject changes itself. "By acting on the external world and changing it," says Marx, "man changes his own nature" (*Capital*, I, 198). Human nature, then, far from being a *constant* in world history, definable in terms of fixed instincts and desires, becomes a *variable* which within limits can be modified by man's social and historical activity. "All history," he proclaims, "is the progressive modification of human nature." The gradual changes in human nature which are the result of the evolution of the forces of production produce sudden changes in the social relations of production. Sudden changes in the social relations of production can be effected only by political revolution. In class societies social evolution is impossible without political revolution.[66]

5. *Dialectic and Nature.*

Upon the foregoing interpretation the attempt to apply the dialectic to nature must be ruled out as incompatible with a naturalistic starting point. Marx himself never speaks of a *Natur-Dialektik*, although he was quite aware that gradual quantitative changes in the fundamental units of physics and chemistry result in qualitative changes. Engels, however, in his *Anti-Dühring* and in his posthumously published manuscript *Dialektik und Natur* openly extends the dialectic to natural phenomena. His definition of dialectic, however, indicates that he is unaware of the *distinctive* char-

[66] *The Poverty of Philosophy*, English trans., 1910, p. 180.

acter of the dialectic as opposed to the physical concept of "change" and the biological concept of "development." "Dialectic," he writes, "is nothing more than the science of universal laws of motion and evolution in nature, human society and thought."[67] Practically all of knowledge, therefore, falls within its scope; and every thinker from Thales down could claim to have in some sense advanced the science of dialectic. Only an idealist can adhere to the distinctive connotation of dialectic expounded above and still believe that nature, independent of man, is an illustration of it. Galileo's laws of motion and the life history of an insect have nothing to do with dialectic except on the assumption that all nature is spirit. Here as elsewhere, Engels swallowed more of Hegel than, as a naturalist, he could properly digest; and one is tempted to say, that it kept coming up throughout his work.

The dialectical principle in Marx, however, expresses primarily the logic of *historical consciousness* and *class action*. The natural objective order is relevant to dialectic only when there is an implied reference to the way in which it conditions social and historical activity. And as a materialist Marx believed that although activity is impossible without nature, nature itself has existed, can exist and will exist without social activity.

[67] *Anti-Dühring*, 12th ed., p. 144.

MILL'S METHODS AND FORMAL LOGIC

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Though practically every logic text since J. S. Mill has two parts, deduction and induction, the authors either hesitate to explain the precise relation between the two or they hasten to explain that the two are not antithetical. A casual survey suggests a superficial explanation of the situation, namely, that in the course of the growth of modern science a number of new topics have forced themselves from time to time upon the attention of logicians, and since these could not readily be assimilated to the scholastic logic, they were appended as special topics under the convenient label "induction." Aristotle's "topics" were used to justify this label and it was pretended that he himself recognized a distinct logic of induction in which he happened not to be interested (presumably because he was not a scientist), although it was a matter of common knowledge that Aristotle's so-called induction was merely a particular type of syllogism. Francis Bacon's enthusiasm for what the scholastics called invention yielded in his mind a New Organon, which transformed invention into induction and discovery into science. Given a new logic, called inductive, it was natural to assume that the old logic is deductive. Thus the conviction grew that there are two kinds of logic. But when the attempts were made to define the relation between them, the utmost confusion resulted, revealing the fact that the distinction had crept into logic surreptitiously. Though the theory of induction remained confused, it became increasingly clear that its subject matter was derived from the experimental techniques of

physical science. The impression grew that modern science is essentially inductive and is developing its own logic. The gentleman's agreement which pretends that the two logics supplement each other, though evidently a mere evasion, has remained the conventional academic procedure. After all, it was only the students who suffered when logic became a two-volume science.

However, such an historical account of how induction crept into logic is superficial, since it fails to explain why the logical processes of so-called inductive modern science persistently evaded definition in terms of formal logic. It was obvious from the start that in practice the logic used by mathematicians was also the logic used by experimental scientists, since experiment and mathematics went hand in hand. Reason is reason; consequently logic is logic. It is absurd to suppose that evidence is one thing in the law court and another in the laboratory. And it is paradoxical that the logic of experiment should be opposed to the logic of demonstration, when everyone knows that experiments are intended to demonstrate.

In J. S. Mill himself the confusion on this subject is so evident and has been so often exposed that I need only make passing reference to it. In the opening paragraph of his *System of Logic,* Book II, "Of Induction," he defines his aim as being: "the foundation of practical rules, which might be for induction itself what the rules of the syllogism are for the interpretation of induction." Since he defines induction itself as the "process of generalizing from experience," it follows that the preceding statement means that the syllogism is the rule for the interpretation of generalizations, and that the logic of generalization itself consists of "practical" rules which define "what conditions render it legitimate." These

rules are apparently to be derived from the "methods which scientists employ in their habitual pursuits," and hence might be expected to be *methods* of experimental procedure. But on the very next page, he redefines induction as "the operation of discovering *and proving* [italics mine] general propositions." When in Chapter VIII he comes to formulate what he still labels "methods of experimental inquiry," they are actually treated as canons of proof for "inductive arguments."

This fundamental confusion in Mill's treatment of the logic of induction was exaggerated by the attacks of Whewell, which forced Mill into making the confusion worse in order to prove that Whewell had a different and erroneous conception of the nature of induction. Whewell restricted the term definitely to the process of discovery and refused to admit that Mill's "Methods," or any others, could dictate the practical devices to which an experimenter must resort in making discoveries. Furthermore, his theory of knowledge was based on a theory of *interpretation* of experience, not on the theory of *generalization,* as was Mill's. Mill sums up the essence of the dispute very well:

> There is a striking similarity between the objections here made against Canons of Induction, and what was alleged, in the last century, by as able men as Dr. Whewell, against the acknowledged Canon of Ratiocination. Those who protested against the Aristotelian Logic said of the Syllogism, what Dr. Whewell says of the Inductive Methods, that it "takes for granted the very thing which is most difficult to discover, the reduction of the argument to formulae such as are here presented to us." The grand difficulty, they said, is to obtain your syllogism, not to judge of its correctness when obtained [Book III, Chap. IX, Sec. 6].

It is evident that in the face of such criticism Mill was forced to admit that his canons were purely formal rules of proof,

not practical rules of investigation. But this admission made their relation to the syllogism all the more suspect.

I shall not belabor poor old Mill further; Whewell really performed that uncharitable act very effectively, and had not Whewell's own theory been popularly associated with intuitionism, a priorism, and his D.D., he might have put the logic of induction on a much clearer basis. The subsequent history of the controversy, however, has not been based on Whewell, though its outcome has tended in his direction.

My quarrel is, therefore, not with Mill but with those more recent logicians who have exposed Mill's confusions but evaded the problems suggested by them. Bradley and Joseph, following him, have pointed out that the reasoning in Mill's "Methods" is really deductive, and they have even tried to reduce it to syllogistic form, suggesting that it is disjunctive. They regard the procedure as essentially the elimination of alternatives. Thus:

X is either a *or* b or c . . . or z;
X is not b or c . . . or z;
$\therefore$ X is a.

This analysis, however, applies strictly only to Mill's "method of residues," since the various factors are regarded as causes already determined as alternatives and completely determined. This procedure really begs the question, and Mill himself recognized the fact that the method of residues was merely a process of subtraction and not experimental at all.

Joseph points out that the distinctly inductive procedure is contained in the discovery of the disjunctive minor premise: X is not c or d . . . or z. This procedure he then casts into the following syllogistic form:

Nothing is the cause of X in the absence of which X occurs;
b is a thing in the absence of which X occurs;
$\therefore$ b is not a cause of X.

Then follows this remarkable passage:

It appears plainly enough in this analysis how all induction rests on the Uniformity of Nature; for in proving the minor of the disjunctive argument a principle is always appealed to, that would fall to the ground if the Uniformity of Nature were denied. It is not indeed necessary, in a particular investigation, to assume this uniformity to extend beyond the department of facts with which we are dealing; if I am looking for the cause of cancer, it is enough that cancer should be subject to uniform conditions in its occurrence; and I should not be impeded in my research by the fact that thunderstorms occurred quite capriciously. There is, however, no ground for assuming cancer to be subject to uniform conditions in its occurrence which does not apply equally to thunderstorms, or to anything else that could be mentioned; if I assume the principle of Uniformity at all, I must logically assume it altogether; and so, though I may be said to appeal to it in any particular inductive argument only so far as concerns the department of nature to which my investigation belongs, I really assume it universally. (*Cf.* what Aristotle says of the assumption of the Law of Contradiction implied in all syllogisms, *An. Post.* a. xi. 77a 22-24.) Nevertheless it is not correct to say that it is the ultimate major premiss of all inductions (Mill, *Logic,* III. iii. §1 *med.*) for that implies that an inductive argument is, formally considered, a syllogism, and we have seen that it is not [H. W. B. Joseph, *An Introduction to Logic,* p. 407].

He had just proved that "formally considered" an inductive argument *can* be put into syllogistic form. Therefore what this passage really implies is that, since syllogisms require specific major premises, not a single "ultimate" premise, the appeal to the uniformity of nature as the major premise of all inductions is quite gratuitous. Joseph appears to have suspected this, for in a footnote to this passage he calls attention to the fact that the principle of the uniformity of nature is implied in induction in precisely the same way that the law of contradiction is implied in all syllogisms.

Had he carried out the implications of this remark, he could have insisted that the formal analysis of inductive arguments is thoroughly syllogistic—and then I should have had no more to say here. Fortunately he missed the point and proceeded to discuss the "rules of cause and effect" in the manner of conventional inductive logic.

Mr. W. E. Johnson, on the other hand, missed the truth by a more ingenious course of argument. He saw the futility of the appeal to the uniformity of nature and proved conclusively that inductive arguments imply specific major premises. But he regarded this as merely an amendment of Mill and proceeded to restate Mill's canons accordingly, as we shall see, without analyzing their relation to syllogistic forms. In fact, being logically ingenious and metaphysically superficial, he did the obvious thing. He cleared up the confusion in Mill by distinguishing two kinds of induction, demonstrative induction and problematic induction. The former calls for some technical revisions in Mill's canons; the latter calls for an analysis of probability. To avoid further confusion he gave to problematic induction the name of *e*duction; and thus logic became a three-volume science.

Miss Stebbing, in her recent *Modern Introduction to Logic,* has reverted to the two-volume scheme. The first part of her *Logic* is devoted to the science of pure form or propositional analysis; the second part, to scientific method. Of these two parts she says, "Their precise relation is seldom stated with any approach to clearness, but, since scientific method is essentially logical and since the validity of reasoning depends upon its form, it follows that these topics are closely connected" (page 477). This does not throw much light on the subject; and she even adds to the mystery by asserting that the science of form (Part I) historically developed out of the analysis of reasoning (Part II). She re-

verses Mill's statement that the formal or deductive systems are interpretations of experience, and maintains that such systems themselves must be interpreted by being applied to experience.

> The logical analysis of the method whereby such generalizations and theories are obtained constitutes what is now generally called "scientific method" but which has also been called "inductive logic." . . . From the logical point of view the discussion of scientific method is concerned with two quite different problems: (1) the analysis of scientific method; (2) its logical justification [page 487].

Though this last distinction is quite clearly stated, its application in the book is not so clear. When it comes to Mill's methods, she definitely revises them so that they can stand as methods of experimental procedure, and postpones the problem of "logical justification." This problem turns out to be merely the general problem of the relation of general knowledge to experience which is discussed in terms of the light which the theory of probability sheds on the problem of causation.

Professor Eaton's recent *General Logic* exhibits a similar hesitation to free itself from old confusions. His analysis of Mill's canons makes it beautifully clear that both the language of causal connection and the question of the uniformity of nature are irrelevant to the logic of induction. He restates Mill's methods in terms of purely logical implication and proves that the "principles underlying the eliminations in Agreement and Difference" are "purely formal principles of deductive logic" (page 522), and he even gives their precise mathematical formulation. But he refuses to "turn induction into deduction" (page 542) because he treats Mill's methods as methods of generalization, rather than of proof. He thus reverts to the more orthodox inter-

pretation of induction, and he explains its relation to deduction by saying that "inductive systems" become deductive in their later stages of development.

Inductive and deductive procedure are the inverses of one another in this sense: the generalizations of a deductive system prescribe conditions to which particulars must conform if they are in the system; the generalizations of an inductive system are prescribed by the particulars antecedently assumed to be in that system [page 484].

But strictly speaking, as he points out at the top of this same page, no system is as such either inductive or deductive; it is simply logical. Therefore, the distinction between induction and deduction concerns only the opposite ways of arriving at systems, and not the analysis of systematic structure at all. Hence Eaton attempts to discuss what he calls "the logic of the natural sciences" in terms of procedure, not of proof.

Professor W. P. Montague's *Ways of Knowing* contains an ingenious revision of Mill's methods and a systematic arrangement of them so that they perform increasingly delicate tasks of eliminating the irrelevant. He treats them as practical rules of scientific procedure rather than as formal canons of proof and therefore defends their utility for causal analysis. With the problem of their utility we are not concerned here; suffice it to say that whatever utility these methods may have for the discovery of cause-and-effect relations, they also have for dialectical analysis, definition and division.

Professor Homer H. Dubs, in his *Rational Induction,* does the exact opposite. He follows Joseph in regarding Mill's canons as purely formal or deductive, but he thinks they are "deduced from the definition of cause and effect." Consequently, he sums up the situation by saying that they are

"canons of deduction which are commonly employed in inductive reasoning" (page 320), thus eating his pie and leaving the crust to save appearances.

In short, the logical function of methods of induction is today at least as great a mystery as it was in the days of Mill. Some logicians are trying to revise the methods so that they will be genuine principles of proof; others are trying to make them over into useful methods of experimentation. Now, in this paper, I shall reverse this procedure and instead of asking what induction is and what Mill's methods should have been, I shall dismiss the various kinds of -duction entirely and explain what Mill's methods actually are. I shall try to prove that they are merely reformulations of Aristotelian logic. In fact, what follows is but a commentary on, and detailed demonstration of, Professor Morris R. Cohen's contention:

> If an inductive inference is valid it must conform to the condition of all valid inference. If the latter is called deduction, induction is not its antithesis, but a special form of it [*Reason and Nature,* page 116].

This amounts to a "reduction of induction to syllogistic form." Had I been able to use modern mathematical symbolism, I should have preferred it to the syllogistic: I could then have followed out the direction taken by Eaton, but, as it is, I must content myself with the Aristotelian symbolism and take for granted that if I can prove my point by using syllogistic analysis, *a fortiori* it could be proved by using the mathematical.

II

I suppose it is unnecessary to prove that of Mill's five methods only two are basic, for Mill himself pointed out that the method of agreement and the method of difference are ultimately the only possible ways of observing causal con-

nection. The joint method is obviously based upon them; the method of concomitant variations is a modification of the method of difference; and the method of residues is merely a mathematical operation and in Mill's sense not an inductive method at all. Confining our attention to the two basic methods we note with Mill that

> The Method of Agreement stands on the ground that whatever can be eliminated, is not connected with the phenomenon by any law. The Method of Difference has for its foundation, that whatever can not be eliminated, is connected with the phenomenon by law [Book III, Chap. VIII, Sec. 3].

The ground of the method of agreement may be restated by saying that any character which is sometimes X and sometimes non-X is not an essential attribute of X. Similarly the method of difference implies that any character which is always X and never non-X is an essential attribute of X. I have here changed the language from Mill's use of causal "connection" and "law" to the scholastic language of definition, but the meaning of the statements is unchanged. In other words, the method of agreement excludes the irrelevant, and the method of difference selects the essential.

These two principles are obviously a restatement of the classic procedure of definition and division. The aim of the method of agreement is the inclusion of X in an inclusive class, A, such that any X is A. This is done by eliminating from the content of X all classes which are sometimes X and sometimes non-X; in classical terms, eliminating the accidents. But by this method it is difficult to find the smallest class inclusive of X, its proximate genus. The method of difference accomplishes this task. By eliminating a single class, A, it eliminates X. This, in scholastic terminology, would indicate that A is the definition of X, or, if you prefer Mill's language, that A is connected with X by law. It

will be observed that in all this procedure X has remained the subject of definition. We are not able to say that any A is X, or that $X = A$, so long as we are dealing with probable knowledge, as in physical science we evidently are, for A has not been analyzed as X has; or, to revert to Mill's language, we have selected instances of X, not of A. Presumably A could be analyzed in relation to any number of other variables besides X; whereas X has been so analyzed and only A found to be constant. In the case of the method of difference a certain amount of negative analysis has been performed on the class, A, for we know that *No non-A is X*, as well as that *No X is non-A*. This discovery of mutual exclusiveness, which, as Mill points out makes the method of difference more valuable than the method of agreement, will be recognized as a restatement of the principle of distribution of terms, whereby an E proposition can be converted simply and an A not.

We may now sum up the results of our two methods in two propositions: by the method of agreement we discovered that any observed X is A; by the method of difference that no observed X is non-A. It is obvious that these two propositions imply each other.

No doubt I have rehearsed enough of these elementary considerations to prove that Mill's methods of experiment can be translated into principles of definition or division. In other words, it is obvious that Mill is thinking in terms of the traditional subsumptive logic, though he changed the terminology, and that his principles of excluding the irrelevant and selecting the indispensable are simply transcriptions of the affirmative and negative types of propositions.

Now, just as a syllogism is the application of a general definition to a particular case, so the prediction of a particular causal connection on the basis of Mill's methods is mere-

ly a continuous process of application of formulae to facts for verification. Hence, the two basic syllogisms, Barbara and Celarent, illustrate the application of Mill's two methods. Barbara asserts that *S* is *P* because it is a new case of *M*, which implies the major premise that all *M* is *P*. Celarent (or, in this case, Camestres) denies that *S* is *M* because it is not a case of *P*, whereas *M* is *P*. Similarly in Mill's analysis by the method of agreement, when a new phenomenon, *S*, is observed to be *P*, it will be regarded as an instance of *M*, since *M* has always been observed to be *P*. And by the method of difference, the absence of *P* from a test case, *S*, will be regarded as evidence that *S* is not a case of *M*, since all *M* is *P*. Perhaps it will be easier to follow the analysis if I put it in hypothetical form:

If *S* is *M*, it is *P*.

By the Method of Agreement, or Affirming the Antecedent:

But *S* is *M*, ∴ *S* is *P*.

And by the Method of Difference, or Denying the Consequent: :

But *S* is not *P*, ∴ *S* is not *M*.

This should be sufficient to indicate the identity between the formal principles of dialectic and of experiment. But I hasten to discuss the point which I have consciously passed over and which you may regard as crucial, viz., the passage from particular cases to the general law, which, according to Mill, constitutes the very essence of induction. If the above analysis is correct, and if by induction is meant the process of generalization, it is clear that the relation between induction and deduction is identical with that between making definitions, or classifications, and using them. The problem then ceases to be one of distinguishing between inductive inference and deductive inference and becomes instead the

general problem of the logical status of universals. Now the above analysis can stand regardless of any particular theory of the nature of general propositions. I have purposely phrased my analysis in terms similar to Mill's in order to show that the language he uses in describing his experimental methods is perfectly consistent with his own interpretation of the syllogism. According to him, the universal proposition *All X is A* is merely a shorthand memorandum recording the fact that all observed *X's* have been *A*, plus a general faith in the uniformity of nature. If that is the meaning of a universal, then certainly he could not object to having his formulae of experimental observation summarized in the language of general propositions. No fallacy of generalization is committed.

If we now take other theories of universals, we find that it makes no difference for the interpretation of Mill's methods. Let universals be axioms, intuitions, hypotheses, postulates, definitions, essences, or parameters, the processes by which they are actually arrived at are not described by Mill's methods. His methods presuppose all these operations; they are "subsidiary to induction." What I have endeavored to prove is that, granting that his methods are formal, they are then mere restatements of the formal principles of dialectic. Mill seems to have been aware of this when he admitted that inductive principles, in so far as they are principles of proof or argument, must rest on a general major premise. He offered the uniformity of nature as a blanket major premise for all inductive arguments. The speciousness of this solution has been proved by others and need not be demonstrated here. The specific uniformities asserted in formulated laws, not the general uniformity of nature, are the real major premises, and these are on the same logical basis as other universal propositions.

If we assume, for the sake of argument, the hypothetical or problematic nature of universals, the two forms of argument might be illustrated as follows:

Procedure	*Syllogistic Form*	*Syllogistic Illustration*	*Experimental Illustration*
	BARBARA or AGREEMENT		
1. To be tested:	1. Any *M* is *P*.	1. Any man is mortal	1. Carbonic acid gas suffocates animals.
2. Test case:	2. *S*, a new case of *M*.	2. Socrates, a man.	2. A dead bird in a bottle of the gas.
3. Implication:	3. *S* is *P*.	3. Socrates is mortal.	3. The bird has suffocated.
4. Observation:	4. *S* is *P*.	4. He dies	4. It has suffocated.
5. Conclusion:	5. The hypothesis still holds.	5. Any man is mortal	5. Any other animal would suffocate.
	CAMESTRES or DIFFERENCE		
1. To be tested:	1. Any *M* is *P*.	1. Any man is mortal	1. Carbonic acid gas suffocates animals.
2. Test case:	2. *S* is not *P*.	2. Christ is risen.	2. Take a living bird.
3. Implication:	3. *S* is not *M*.	3. Christ must not be human.	3. The bird will not live in the gas.
4. Observation:	4. *S* is not *M*.	4. Christ is divine.	4. It suffocates in a bottle of the gas.
5. Conclusion:	5. The hypotheses is verified, No non-*P* is *M* (= *M* is *P*).	5. No immortal is human.	5. No other animal could live in carbonic acid gas.

Had the results of these experiments been negative, new hypotheses would be required and new test cases. In this way

the dialectical application of universals to new cases, which is the essence of experimental verification, gradually establishes the reliability of major premises or theories. But whether or not you choose to accept the experimental theory of demonstration, I think you must admit the formal identity of the syllogistic and the causal illustrations. The difference between them is not logical, but cultural (if I be permitted a moralistic digression): the Greeks were interested in the death of Socrates, the scholastics in the resurrection of Christ, and Mill in the properties of carbonic acid gas.

III

It would be foolish to conclude from the foregoing that the contribution of Mill's canons to logic was purely verbal. It remains for us to examine the positive significance or consequences of Mill's restatement of the principles of evidence for the further development of logic.

In the first place, Mill and his contemporaries reflected the enthusiasm for a new subject matter. They studied the physical sciences assiduously and thought almost exclusively in terms of these experiments and problems. Hence the predominant interest in cause and effect. Hence, also, the impression that the problems of causation are a distinctive logical subject matter. It is strange what a hold that impression still has on logicians. Even H. W. B. Joseph, with all his penetrating Aristotelian criticism of the theory of induction, falls in line with those who treat the determination of causal relations as a special type of logical problem, involving theories of the uniformity of nature, laws of succession, etc. I do not wish to deny that the theory of causation is important philosophically, nor do I overlook the fact that it is a distinct scientific problem, but I have consciously neglected it in the foregoing analysis, because it is really

quite irrelevant to logic. I have tried to prove that it makes no logical difference whether the language of causal relation is used or the language of definition and classification. That may not be true for all theories of causation, but Mill's was certainly modeled strictly on traditional subsumption, on inclusion and exclusion; and though he talked about phenomena, instances, circumstances, antecedents, and consequents, he might just as well have talked about genus and species, whole and part. But he naturally talked the language of his subject matter, the language of the laboratory; and this was historically very important for it changed "logic" into "scientific method," which, to repeat, is theoretically merely a verbal change, but practically quite significant. There were good reasons why the Aristotelian language could not be the language of the modern laboratory, and Mill's methods illustrate them beautifully. For example, Mill had no sooner formulated the canons of agreement and difference, than he realized that for laboratory purposes they would need to be put into more practical form, and consequently he formulated the "method of concomitant variations," which, though logically not distinct, proved to be enormously fruitful. For it expressed simply and clearly the basic principle of quantitative laboratory procedure which underlies the whole theory of measurement and of probability.

The transition from a qualitative language of predication to the quantitative language of prediction made it possible for logic to keep in touch with the practical techniques and modern machinery of thought; though it may also have contributed incidentally to the corruption of modern speech, law and literature. (It is weird to note the difficulties we now find in expressing thoughts by language. We think "operationally" and will soon be able to converse only by measurements or mathematics. Even the writings of recent

logicians reflect the contemporary divorce between logic and speech; and there is irony in the fact that *logic* is derived from *logos*.)

Be that as it may, logic has certainly achieved enormous refinements since Mill gave it this quantitative formulation. For example, W. E. Johnson, taking his departure from the method of concomitant variations, has succeeded in defining experimental principles with admirable, though highly technical, precision. Realizing that Mill underestimated the logical value of introducing only one variable into a demonstration (or experiment) at a time, he revised Mill's methods accordingly. Of his four methods, or figures, two are basic, as in the case of Mill, which he calls the "figure of difference" and the "figure of agreement" (which, however, must not be confused with Mill's by the same names). The principle of the figure of difference, robbed of its technical refinements, is that: If every *abcde* is *p*, and every *abcd'e* is *p'*, then every *abcd''e* is *p''*, which indicates that "the value of *D* is actually operative in determining the value of *P*." (Part II, p. 223). The figure of agreement argues that: If every *abcde* is *p* and every *a'bcde* is *p*, then every *a''bcde* will also be *p*. That is, "the value of *A* is not actually operative in determining the value of *P*" (Part II, page 224). It will be seen that these are two cases, one positive and one negative, of concomitant variation, and they define more clearly than Mill's the principles of experimentation, or as Johnson calls them, "the forms of demonstrative induction." Incidentally, to clinch my argument, may I pause here to point out how these two forms are restatements of Barbara and Celarent. The figure of difference, as symbolized, says: Some *abce* are *p* and some *not-p* (where *not-p* is used in place of the symbol for a variation in *p*). Therefore, given *abce*, nothing can be inferred about *p:* they are irrelevant. But if *d* varies, then *p* varies; *abcd''e* is a variation of *d*, ∴ in that

case *p* will vary. This is syllogistic reasoning in Barbara. In the figure of agreement, *bcde* are irrelevant, though constant, because no case of *non-p* is given, and consequently we do not know whether *bcde* imply *non-p* as well as *p*, or only *p*; therefore to assert *p*, given another *bcde*, would be a fallacy of undistributed middle. It is on this ground that Johnson criticizes Mill's method of agreement when only positive or unvarying instances are given. In the case of *a*, however, we have variation, and the argument is negative: If *a* varies, *p* does not vary: *a"bcde* is a variation of *a*, therefore *p* will not vary. This is a syllogism in Celarent. I have tried to adapt the syllogistic language to the method of concomitant variation, but it is evident that, though the logic is clear enough, the dialectical technique is not adapted to variables. Instead of speaking of a series of *p*'s and *non-p*'s, it is much simpler to be able to describe *p* as $f(d)$. But apart from the convenience and relevance of the mathematical language for physical science, I see no *logical* difference between the dialectical and the functional, causal, instantial (or what you will) type of analysis. Of course, I admit, in my abbreviated statement I have done injustice to the inductive features on which Johnson insists. I have omitted his accompanying "supreme premiss" (his substitute for the law of causation) and his "instantial premisses" which parallel the generalized premises given above. But these complications are really necessary only to save the theory of generalization (to which I shall return in a moment), and do not contribute to the analysis of actual experimental procedure. Similarly his distinction between demonstrative and problematical induction is really based on philosophical rather than logical grounds. For the supposedly demonstrative nature of the former type of knowledge rests ultimately on the basis of what he calls intuitive (or summary) induction, which, according to him, furnishes us with necessary generalizations.

Hence any discussion regarding the validity of generalization concerns intuitive, not demonstrative, induction; and the theory of intuitive generalization rests on psychological and epistemological doctrines, not on logical analysis. For our purposes it is enough that the experimental premises lead us to predict (with whatever degree of probability is possible) the *next* instance. Granted, that on the basis of intuitive generalization we can conclude that *every abcd"e* is *p"*, problematic induction or eduction permits us to predict that the next particular *abcd"e* will be *p"*. But surely if we can predict the next instance, we can predict any, and if *any, all*. There seems no practical logical reason, therefore, for insisting on the distinction between demonstrative and problematic induction, nor on the distinction between demonstration and induction in general. All arguments and experiments concerning existences are both formally demonstrative and scientifically problematic.

This suggests a second way in which Mill's inductive language proved valuable. By shifting the analysis from the domain of *particulars* to the domain of *instances*, he (apparently unconsciously) really made the transition from the logic of subsumption to the logic of measurement. For there is a great difference between the part-whole relationship and the instance-phenomenon relationship. "Instantial reason," to use Johnson's term, presupposes the theory of sampling or of probability. A mere particular is, of course, an abstraction; but an instance is not even a mere part, though Mill treated it as such; it must be to some extent representative or typical. One of the most striking facts about Mill's various illustrations of scientific experiments is that it is usually difficult to tell whether one is really dealing with an instance of *A* or an instance of *B*. Once the experimenter knows definitely *of* what his instance is an instance, half the problem is solved. Or, to put it in other words, the logical value

of an "instance" is its representative value. Instances are highly selected particulars; they are samples. Once the full logical force of this fact is recognized, the problem of judgment is not a problem of generalizing from particulars but of weighing probabilities, testing the evidential value of a case or instance in measurable terms. Categorical truth or falsity thus yields to measures of reliability.

All this is now a commonplace of logical theory. But it is difficult to conceive how this transformation could have come about without the new language of scientific method. Laboratory demonstrations are difficult to state in syllogistic form. Nevertheless, they are demonstrations; they prove as well as discover. Experimental procedure is unintelligible if it is not based on the same formal principles of evidence embodied in the scholastic logic of consistent discourse. These set the pattern, or framework, into which the scientist fits his observations and experiments. If he were not aware of the missing links in the chain of evidence, he might search and research (as they do in some so-called sciences) without making any progress in knowledge. But the forms of knowledge are merely the goals of science; they are neither methods of thinking nor sources of truth. Once these prejudices are dispelled, the traditional distinctions between formal logic and scientific method, deduction and demonstrative induction, may well be discarded. In either case the principles of evidence are the same. The distinction is, therefore, relevant to types of subject matter, of instruments, of precision, and of language but not of logic. Nothing could be more detrimental to the science of logic and the practice of thinking than the current notion that there is a difference between the reason of discourse and the reason of experiment. Common sense would lead us to believe that they must be the same; this paper has attempted to prove that they are.

"IMPOSSIBLE NUMBERS": A CHAPTER IN THE HISTORY OF MODERN LOGIC

ERNEST NAGEL

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THE DISTINCTION, currently recognized, between "pure" and "applied" mathematics, and the identification of the former with logic, is frequently attributed to George Boole, when not regarded as an achievement of contemporary logicians. Very little notice is taken of the fact that Boole was a mathematician of note who shared the philosophy of mathematics of many English as well as continental thinkers of his day.[1] A clear indication that his work in symbolic logic was simply the application to new fields of the dominant conceptions of contemporary mathematicians, is to be found in the Introduction to Boole's *Mathematical Analysis of Logic.*[2]

They who are acquainted with the present state of the theory of Symbolical Algebra are aware, that the validity of the processes of analysis does not depend upon the interpretation of the symbols which are employed, but solely upon the laws of their combination. Every system of interpretation which does not affect the truth of the relations supposed, is equally admissible, and it is thus that the same process may, under one scheme of interpretation, represent the solution of a question on the properties of numbers,

[1] No explicit mention of Boole's mathematical background is found in the historical accounts given by Lewis, H. Scholz, or Venn. No more than a suggestion that there was such a background is given either by Liard or by Joergenson; the source of the latter's information seems to be the good but incomplete accounts by Jourdain in the *Quarterly Journal of Pure and Applied Mathematics,* 1910. Enrique's brief history is characteristically more complete on this point, and Vailati's *Scritti* contains good hints as to sources.

[2] Published in 1847, the same year as DeMorgan's *Formal Logic.*

under another, that of a geometrical problem, and under a third, that of a problem of dynamics or optics. This principle is indeed of fundamental importance; and it may with safety be affirmed, that the recent advances of pure analysis have been much assisted by the influence which it has extended in directing the current of investigation.

But the full recognition of the consequences of this important doctrine has been, in some measure, retarded by accidental circumstances. It has happened in every known form of analysis, that the elements to be determined have been conceived as measurable by comparison with some fixed standard. The predominant idea has been that of magnitude or more strictly of numerical ratio. The expression of magnitude, or of operations upon magnitude, has been the express object for which the symbols of Analysis have been invented, and for which their laws have been investigated. Thus the abstractions of the modern Analysis, no less than the extensive diagrams of the ancient Geometry have encouraged the notion, that Mathematics are essentially, as well as actually, the Science of Magnitude.

Boole's application of mathematical methods to logic must be viewed, therefore, as the working out of the idea that the proper and exclusive subject matter of mathematics is *not quantity*. But the insights into the nature of mathematics which Boole here records did not originate with him, however much he may have contributed to their extension. These were won only after more than a hundred and fifty years of persistent effort on the part of mathematicians to see clearly what was the nature of their science, but which did not find tolerably complete expression before Peacock, Gregory, DeMorgan, Hamilton and Boole resolved to establish algebra on a firm foundation. The story, or at least the partial story, of the clarification of the understanding concerning what mathematics is, is the theme of this paper.

Knowledge of the historical development of certain ideas, however, is not the only thing which can be won from the

study of that development. Not only is the point of contact between recent tendencies in logical theory and a long tradition in mathematics thrown into relief; but I think that the current distinction between "pure" and "applied" mathematics, since it receives ample illustration in the struggles of mathematicians with the principles of their science, is itself clarified. The attempted "identification" of pure mathematics and logic, and the "deduction" of the former from the latter, often appears not as the intelligible process of *exhibiting* the most general principles of a determinate subject matter, but as the unintelligible attempt to *derive* a determinate subject matter from principles so general that they are not exhaustive of any special subject matter at all. For unfortunately, the term "pure mathematics" is not always used unambiguously, and is sometimes even identified with what must be regarded, with good reason, as *applied* mathematics, a branch of natural science: e.g., when by numbers, lines, etc. and their properties, reference is made to the structure of the activities involved in counting, measuring, etc. On the other hand, the concern of many mathematical logicians with the structure of "symbolical" systems, appears to some like a myopic preoccupation with "meaningless marks," so that the bearing of these algebras on a philosophy of mathematics is misunderstood. No doubt a clear apprehension of these matters may be won without recourse to the history of the issues involved. Nevertheless, by indicating the historical setting for current logical theories, even those in fundamental disagreement with them may acquire a richer appreciation of the motivations for their occurrence, and so of the difficulties which these theories are designed to meet.

I

Prior to the first quarter of the nineteenth century, mathe-

matics was universally defined as the science of quantity. It was under the domination of this idea that Euler wrote his influential algebra.

> Everything will be said to be a magnitude [he stated], which is capable of increase or diminution, or to which something may be added or subtracted. Thus a sum of money is a magnitude. . . . There are many different kinds of magnitude, which cannot be all enumerated; on this account there are different branches of mathematics each of which studies a different kind of magnitude, since mathematics is nothing other than the *science of magnitudes*.[3]

Accordingly, "number" is conceived as being, in first and last instance, an answer to the questions "How many?" and, in cases of extensive measure, "How much?"

For a long time this view represented accurately the subject matter of mathematics. Even so, minor crises occurred whenever the range of applicability of the arithmetical operations was extended. For example, multiplication was at first rightly viewed as a repeated addition of concrete units, and since it was defined only for multiplication by abstract integers, it was a process which always *increased* a magnitude. But it soon became imperative to conceive a process of "multiplication" applicable in some sense to *fractions* as well as to integers. There is a dialogue between master and scholar in the sixteenth-century arithmetic of Robert Recorde, in which the pupil struggles with the difficulty that in some cases multiplication should make a thing *less*. The master finally explains:

> If I multiply by more than one, the thing is increased; if I take it but once, it is not changed; and if I take it less than once, it cannot be so much as it was before. Then seeing that a fraction is less than one, if I multiply by a fraction it follows that I do take it less than once.

[3] *Vollständige Anleitung zur niedern u. höhern Algebra*, Berlin, 1796, I, 4. This treatise was first published in 1770.

To which the scholar replies with great courtesy, "Sir, I do thank you much for this reason; and I trust that I perceive the thing."[4] But his politeness is more conspicuous than his understanding, and he is quite unaware that in place of the familiar idea of multiplication as repeated addition, a *different,* and if one likes a misleading expression, a *more general* notion had been substituted.

Now while fractions, and operations with them in accordance with the same formal rules as with integers, had been accepted as "natural" extensions of the original concept of number, "negative" and "imaginary numbers" were not welcomed so readily. After a general method was discovered for solving algebraic equations of the first degree, it was found that in some cases a peculiar kind of root, namely, a "negative number," was obtained. Such roots clearly did not correspond to anything that had heretofore been recognized as quantity; hence what meaning to assign to these "negative quantities" became a serious problem. But the question of "negative quantities" was only child's play when compared with the problem of "imaginary" or "impossible numbers" which involved the square root of negative unity. For expressions involving these turned up as inevitably as "negative numbers" did, when otherwise reliable general methods were used to solve certain quadratic equations.

The problem of these "impossible numbers" is an instance of one of the oft-recurring "crises" in the history of science. Its resolution led to a radical overhauling of traditional notions concerning mathematics, to an enlarged view of formal logic, and to their identification in recent days. Meanwhile, however, mathematicians were in a dilemma. If mathematics was the science of quantity, then these "impossible

[4] Quoted in Philip Kelland and P. G. Tait, *Introduction to Quaternions,* London, 1904, p. 2.

numbers'' must be quantities; but ''negative'' and ''imaginary quantities'' were simply nonsense, incompatible with all previous definitions of quantity. On the other hand, these ''impossible numbers'' were the logical consequences of using certain general and powerful methods for solving equations; and the queer numbers could not be banished without calling to an abrupt halt the gradual perfecting of mathematical techniques. ''Impossible numbers,'' absurd as they were, were undeniably useful, as Descartes recognized, in making the rules of algebra general, and in making evident important analogies between different problems. Which was to be sacrificed—the logical conscience of mathematicians or the development of the science of mathematics?

Most professional mathematicians, like Maclaurin and Euler, did not hesitate to accept the conveniences which the queer numbers offered at no matter what logical price; although they did try to justify, very lamely indeed, ''negative quantities'' by illustrating the difference between these and ''positive quantities'' by the ''analogous'' difference between owing and owning money, etc.[5] But for a long time no one could defend the ''imaginary numbers'' with any plausibility, except on the logically inadequate ground of their mathematical usefulness.[6] At best, the occurrence of an ''imaginary root'' to an equation was taken to indicate that the problem proposed was impossible of solution because it involved a contradiction in terms. At worst, ''imaginary

[5] Euler, *op. cit.*, p. 10.

[6] Euler declared: ''Weil nun alle mögliche Zahlen, die man sich nur immer vorstellen mag, entweder grösser oder kleiner als 0, oder 0 selbst sind; so ist klar, dass die Wurzel von negativen Zahlen nicht einmal unter die möglichen Zahlen gerechnet werden kann. Folglich muss man behaupten, dass sie unmögliche Zahlen sind. Und dieser Umstand leitet auf den Begriff von solchen Zahlen, welche ihrer Natur nach unmöglich sind, und gewöhnlich imaginäre oder eingebildete Zahlen genannt werden, weil sie bloss in der Einbildung statt finden.'' *Op. cit.*, pp. 71-72.

quantities'' were frankly accepted as a ''mystery,'' and used to support the mysteries of orthodox Christianity.[7]

But if ''number'' was nothing else than the answer to ''how many'' or ''how much,'' ''negative'' and ''imaginary numbers'' had no place in mathematics. And those who refused to admit them unquestionably had logic on their side, even though in their fierce logical fanaticism they were less wise than those who did. There were many who could not compromise with their logical consciences. Robert Simson, an excellent mathematician and scholar, was one such.[8] And lesser men, like Baron Maseras[9] or William Frend, future father-in-law of DeMorgan and learned anti-Newtonian to boot, stated their views in no mincing language.

Frend's objections are still instructive as well as amusing.

> The ideas of number are the clearest and most distinct in the human mind; the acts of the mind upon them are equally simple and clear. There cannot be confusion in them. . . . But numbers are divided into two sorts, positive and negative; and an attempt is made to explain the nature of negative number, by allusion to book-debts and other arts. Now, when a person cannot explain the principles of a science without a reference to metaphor, the probability is, that he has never thought accurately upon the subject. A number may be greater or less than another; it may be added to, taken from, multiplied into, and divided by another number; but in other respects it is intractable: though the whole world should be destroyed, one will be one, a three will be a three; and no art whatever can change their nature. You may put a mark before one, which it will obey: it submits to be taken away from another number greater than itself, but to attempt to take it away from a number less than itself is ridiculous. Yet this is attempted by algebraists, who talk of a number less than nothing, of multiplying a negative num-

[7] Royal Astronomical Society, *Memoirs*, 1842, XII, 459.
[8] *Life and Writings of Robert Simson*, London, 1812, p. 67.
[9] Cf. DeMorgan, *Budget of Paradoxes* (Open Court Ed.), 1915, I, 203.

ber into a negative number and thus producing a positive number, of a number being imaginary. Hence they talk of two roots to every equation of the second degree . . . they talk of solving an equation which requires two impossible roots to make it soluble: they can find out some impossible numbers, which, being multiplied together produce unity. This is all jargon, at which common sense recoils.[10]

Frend rejected, therefore, the principle that every equation has as many roots as its degree, and wrote a treatise which consistently developed the position that algebra was nothing else than a symbolical treatment of *arithmetic*, that is, of *quantities* in the strictest sense. No "negative" or "imaginary numbers" found a place in it, and Frend described those who permit them as

grave men, imitating the philosophers of a well-known region, who were extracting sun-beams from cucumbers, wasting the midnight oil just as profitably in settling the rights and privileges of impossible quantities. The fruits of their lucubrations I sucked in with the first milk of alma mater; and, if the good old lady had not driven me from my books and from studies of a much superior nature, it is not improbable that I might still have looked on these subjects through her spectacles. . . . Being no longer of an age nor of a disposition to take for granted an old wives' tale, I started at the postulate to make a load of corn out of a bushel.[11]

Without question Frend and those like him were in the right in rejecting "impossible numbers," *if* mathematics was the science of quantity. And there is no doubt that criticisms like those of Frend were instrumental in bringing about a theory of "impossible numbers" which not only recognized their usefulness, but supplied for them a logically impeccable foundation. Nonetheless, mathematicians who refused to banish them because such foundations were lacking,

[10] William Frend, *Principles of Algebra*, London, 1796, pp. x-xi.
[11] *Principles of Algebra*, London, 1799, Part Second, pp. ix-x.

were not fools either, as subsequent events showed. For in developing a *calculus* of "impossible numbers," they paved the way for the rapid advance of algebra when once they, and the operations upon them, were shown to be as "intelligible" as was arithmetic. Certainly the history of mathematics confirms Mach's penetrating comment, that the "student of mathematics often finds it hard to throw off the uncomfortable feeling that his science, in the person of his pencil, surpasses him in intelligence."

We now turn to the tentative gropings of mathematicians toward the insight that their science does not deal *exclusively* with quantities, and even does not deal with quantities *at all.* We may distinguish two stages in the growth of this view. The first consists in repeated and finally successful attempts to find a geometrical *interpretation* (or "meaning") for "imaginary" as well as "negative numbers." The second consists in the frank recognition that mathematics as a "pure" science is not concerned with any special interpretations of its symbols, but has as its subject matter the structure of systems of uninterpreted signs which are capable of any number of different interpretations.

II

Interpretations for "negative numbers" which were intuitively satisfactory were long familiar, when John Wallis tried to give an equally satisfactory meaning to "imaginary" ones.[12] He made clear, however, that an imaginary root, "as the first and strict notion of what is proposed," denotes nothing more than that a problem is incapable of solution. "For it is not possible, that any Number (Negative or Affirmative) Multiplied into itself, can produce (for instance) –4.' But he hastened to add that

[12] *Treatise of Algebra,* 1685, Chaps. LXVI, LXVII.

it is also Impossible, that any Quantity can be *Negative.* Since that it is not possible that any *magnitude* can be *Less than Nothing,* or any *Number Fewer than None.*

Nevertheless, Wallis continued, "negative quantities" are useful. As a "bare Algebraick Notation," it is a quantity less than nothing, and so absurd; but as a *sign* having a "physical Application, it denotes as Real a Quantity as if the sign were +." His interpretation of a "negative number" is the familiar one of a length with direction opposite to that of a length symbolized by a "positive number." Similarly, while there cannot "in strictness of speech" be a root of a negative square, such an expression may be interpreted, he argued, no longer, indeed, as a directed line comparable with the two directions of a straight line; but as a segment whose *length* is the *mean proportional* between lengths having opposite directions, and whose *direction* lies in between these directions, and at some angle or other to the straight line.

Wallis was obviously on the track of a very important idea, namely, that a "bare Algebraick Notation," whether it involved "positive," "negative" or "imaginary" expressions, could be made perfectly intelligible, provided they were not regarded as standing "intrinsically" or "naturally" for quantities. If he was unable to apprehend this fully, it was because he believed that "in strictness of speech" algebraic signs could not refer to more complex structures of relations than hitherto recognized. As it is, he had nothing to say concerning the interpretation of the signs of addition and multiplication of imaginaries. So long as a special interpretation of an algebra is taken as the "natural" or exclusive one, certain combinations of its signs must also be taken as "intrinsically" and absolutely impossible expressions.

This provincialism with respect to the possible interpreta-

tion of a calculus still characterized Playfair, when a hundred years later he reviewed the status of the "imaginary numbers." He contrasted the unsatisfactory state of the theory of algebra with the perfection of geometry, and attributed the difference to the fact that the languages employed in these disciplines *symbolized in different ways.*

The propositions of geometry have never given rise to controversy, nor needed the support of metaphysical discussions. In algebra, on the other hand, the doctrine of negative quantity and its consequences have often perplexed the analyst, and involved him in the most intricate disputations. The cause of this diversity must no doubt be sought for in the different modes which they employ to express our ideas. In geometry every magnitude is represented by one of the same kind; lines are represented by lines, and angles by an angle, the genius is always signified by the individual, and a general idea by one of the particulars which fall under it. By this means all contradiction is avoided, and the geometry is never permitted to reason about the relations of things which do not exist, or cannot be exhibited. In algebra, again, every magnitude being denoted by an artificial symbol, to which it has no resemblance, is liable, on some occasions, to be neglected, while the symbol may become the sole object of attention. It is not perhaps observed where the connection between them ceases to exist, and the analyst continues to reason about the characters after nothing is left which they can possibly express: if then, in the end, the conclusions which held only of the characters be transferred to the quantities themselves, obscurity and paradox must of necessity ensue.[13]

Playfair here almost guessed the secret of the nature of mathematics. But in spite of his acute remarks on signs, his ideas were essentially naïve; he did not see that geometric diagrams did no more "naturally" represent configurations

[13] John Playfair, "On the Arithmetic of Impossible Quantities," *Phil. Trans.*, Royal Society, LXVIII (1778), 318.

in space, than did algebraic diagrams (*i.e.*, signs) "naturally" and necessarily represent quantities. Hence "imaginary numbers" were, for him, "paradoxical," even though they can be the subjects of what seemed to be arithmetical operations. But then how explain that such operations upon "imaginary quantities" lead us to important theorems in both algebra and geometry—theorems which can be demonstrated by other, unexceptionable methods?

Here then is a paradox which remains to be explained. If the operations of this imaginary arithmetic are unintelligible, why are they not also useless? Is investigation an art so mechanical, that it may be conducted by certain manual operations?[14] Or is truth so easily discovered, that intelligence is not necessary to give success to our researches?[15]

Playfair's answer was at best a lame one. Upon examining several instances where "unintelligible" operations lead to significant conclusions, he discovered that the usefulness of these operations depends upon there being certain analogies in form between expressions involving the imaginaries and other expressions which do not. Thus, for example, he found that the *sine* and the *cosine* of an angle can be stated in terms of the exponential function e with "imaginary" exponents, and hence that many properties of the *circle* can be formulated in terms of "imaginary numbers"; but he also found that when in such expressions $\sqrt{1}$ is substituted for $\sqrt{-1}$, true theorems concerning the *hyperbola* are obtained. Accordingly, the value of "imaginary numbers" lies in their *suggesting* to us, but not *demonstrating,* analogous theorems for other geometric figures.[16] His final word is that the deductions into which they enter are thus reduced to an

[14] He had declared that the name of reasoning cannot be given to the process of calculating with "impossible numbers."
[15] *Op. cit.*, p. 321.
[16] *Op. cit.*, p. 326.

argument from analogy. . . . The arithmetic of impossible quantities will always remain a useful instrument in the discovery of truth, and may be of service when a more rigid analysis can hardly be supported.[17]

Thirty years later, in an unsigned review of an important paper of Buée, (in which a successful geometric interpretation was given to the arithmetic of imaginaries) Playfair was still priding himself on his refusal to depart from the traditional view of mathematics as the science of quantity.

The essential character of imaginary expression [he said], is to denote impossibility; and nothing can deprive them of this signification. Nothing like a geometrical construction can be applied to them; they are indications of the impossibility of any such construction, or of anything that can be exhibited to the senses. . . . There have been more than one attempt to treat imaginary expressions as denoting things really existing, or as certain geometrical magnitudes which it is impossible to assign. The paper before us is one of these attempts: and the author, though an ingenious man, has been betrayed into this inconsistency by a kind of metaphysical reasoning.[18]

And yet, characteristically and amazingly enough, Playfair managed to catch more than a glimmer of the truth which was not to shine brightly for some years:

The imaginary symbols, considering them quite abstractly from their significance, may be treated by the rules usually employed in those operations. . . . In this we have a most

[17] *Op. cit.*, p. 342.

[18] *Edinburgh Review*, XII (1808), 306 ff. He continued, with British obstinacy: "The author [*i.e.*, Buée] has, by certain metaphysical subtleties, set himself above the plain dictates of elementary science. We do not, indeed, very clearly comprehend many of the subtleties, and we do not much lament that we feel an incapacity of doing so. It seems very useful, on some occasions, to have one's head fortified with a decent degree of obtuseness to prevent the influx of false refinements, which, when suffered to intrude themselves into the mind, are very apt to disposses the lawful inhabitants" (p. 312).

extraordinary power of signs. . . . A set of quantities, or of conditions, some of which are inconsistent with one another, are thus combined together: no idea is attached to the symbols; and from the series of operations, that may be said to be mechanical, and performed merely by the hand, a truth, applicable to quantities that really exist, emerges at last. . . . We come at truth by the help of the symbols alone; by the operations that are applicable to them alone, and that have no reference to anything really existing. Nothing, certainly, can show so clearly the power of conventional signs in matters of reasoning; and the importance, on many occasions, of neglecting the object, and attending to the sign alone.

But the line of inquiry opened by Wallis had been brought to a successful conclusion before Playfair penned these remarks. A consistent interpretation of "imaginary quantities" and the familiar operations upon them was discovered, when the former were used to represent directed lengths in a plane, "addition of imaginaries" to represent the geometric addition of such lengths, and "multiplication" to represent their rotation through designated angles.

The first to succeed in giving a complete geometric meaning to the arithmetic of imaginaries was Caspar Wessel, a Danish surveyor, whose work, however, remained unknown until after his results were rediscovered.[19] Nine years later, in 1806, two similar geometrical interpretations were published, both by Frenchmen working independently of each other. Buée, whose paper has already been mentioned, regarded the square root of negative unity not as determinate quantity, but as an additional "sign of affection" or quality which was capable of characterizing the unit of length.[20]

[19] G. Loria, "L'Enigme des nombres imaginaires à travers les siècles," *Scientia*, XXI, Supp., 43 ff.

[20] Buée, "Mémoire sur les quantités imaginaires," *Phil. Trans.*, Royal Society, 1806, p. 27.

He interpreted it as the sign of perpendicularity, and stated, in an obscure manner to be sure, definitions for adding and multiplying the directed lengths thus symbolized by the imaginaries. The other essay was by Argand, whose name is now universally associated with the representation of directed coplanar lines by complex numbers. Although his exposition of the interpretation was a model of lucidity, it was neglected for several years until Français and Gergonne recognized its importance.[21] Finally, some years later Gauss and Mourey developed such an interpretation for the ordinary complex numbers, the former in what is now its canonical form. The latter tried to introduce a new type of complex number in order to develop a calculus for the geometry of three dimensions, but he did no more than formulate the program for such an enterprise.[22]

The whole matter of the geometrical interpretation of imaginaries was discussed in an authoritative manner by John Warren. Declaring it to be a scandal that the "real nature"

[21] On the question of priority between Buée and Argand, there is an interesting correspondence between DeMorgan and Sir Wm. R. Hamilton, *Life of Sir. Wm. R. Hamilton* by R. P. Graves, Dublin, 1882, III, 316, 437-41.

In Gergonne's *Annales de mathematiques* V (1813), Français admitted he obtained the ideas for his own paper on imaginaries from Legendre, who in turn learned them from Argand. Even at this late date it was possible for Servois to object that the line represented by $a\sqrt{-1}$ *cannot* be a mean proportional to the lines $+a$ and $-a$. Cf. p. 228. Gergonne replied in effect that Servois forgets that $a\sqrt{-1}$ does not simply represent a quantity but a direction as well; he thus showed he was aware algebraic expressions need not be taken as necessarily representing simple quantities. Gergonne's own paper on negative quantities is a very intelligent discussion of the subject, and makes clear the conventional element in the interpretation of the algebraic signs $+$ and $-$.

[22] C. V. Mourey, *La Vraie Théorie des quantités negatives et des quantités prétendues imaginaires,* Paris, 1828. Mourey discusses the view, familiar by then, that a "pure" algebra is not concerned with the interpretation of its symbols (pp. v-vii).

of imaginaries was still unknown and their "real existence" even denied, he proposed to examine and finally dispose of all the known objections against them. He pointed out that, in any case, imaginary "quantities" were capable of undergoing operations analogous to those upon ordinary quantities. He therefore concluded that "the operations of algebra were more comprehensive than the definitions and fundamental principles" of the ordinary quantities. He conceived his problem to be the finding of such "general definitions and fundamental principles" as were applicable to both "real" and "imaginary" quantities alike. And he thought he found its solution by regarding algebra as representing, in the well-known manner, directed segments in the plane.

It was the objections to this conclusion that he carefully examined. To the objection that imaginaries were merely signs of impossibility and so without "real existence," he replied that though they were signs of impossibility in some cases, they were not so in all, and that in this respect they resembled *fractions*. "If we have a question, which from its nature does not admit of a fractional answer, and in resolving this question we arrive at an equation, which only admits of fractional roots, these fractional roots are in this case a proof, that the question involves an impossibility."[23] This answer represented a great advance in thought, for it showed that "impossible" was now clearly recognized as a relative term. Whether a combination of symbols is to be declared impossible or not, depends altogether on the interpretation which may be given them and upon the conditions of the problem in which they function. The question is

[23] "Considerations of the Objections Raised against the Geometrical Representation of the Square Roots of Negative Quantities," *Phil. Trans.*, Royal Society, 1829, p. 244.

not to be settled *antecedently* to such an interpretation. Mathematics was now well on its way to freeing itself from the shackles of a too narrowly conceived theory as to its nature.

A second objection which Warren considered was that there is no necessary connection between algebra and geometry, so that it is improper to bolster up the former by appealing to the latter. His reply was, unfortunately, much less satisfactory than to the preceding objection. Briefly, he declared that since negative as well as imaginary quantities are "mere absurdities" arithmetically considered, a convention must of necessity be made whereby such expressions represent something or other, and thereby acquire "real existence."[24] In other words, Warren regarded the algebraic operation upon imaginaries to be valid only in so far as the latter had some *specific* extrasystemic reference. This was a definite recognition that algebra *need* not have arithmetical numbers as its subject matter, and so indicated a wide departure from traditional ideas. But what if more than one distinct interpretation can be given to the symbols of algebra? What is the defense to be offered for an algebra cultivated with no reference whatever to any specific interpretation? To such queries Warren had no reply, and we must turn for an answer to a group of men who laid the basis for the modern theory of algebra and logic.

III

The view that imaginary numbers were "intelligible" when given a geometrical interpretation, dispelled ancient prejudices and provided a useful calculus for the geometry of the plane. It was, however, still far from being an adequate philosophy of mathematics. It had nothing to say

[24] *Ibid.*, p. 250.

concerning what imaginaries were when not so interpreted, or why the mathematician could study them even apart from any of their specific interpretations. It still supported the notion that the *validity* of a mathematical *demonstration* depended upon the *specific* nature of the subject matter studied, and so did not distinguish between mathematics as "pure" and mathematics as a natural science. Hence it overlooked the fact that a generalized algebra or "pure" mathematics was concerned with the *formal properties* which different subject matters shared—properties which are exhibited in the structure of the symbolism which the algebra employs. And so it failed to note that both algebra and geometry, when not cultivated as natural sciences but as "pure" mathematics, are both primarily *languages* or complex *structures of symbols;* that both can be interpreted in more than *one* way as referring to extrasystemic entities; and that both are hypothetico-deductive sciences, their task being to unravel the logical consequences of their premises, *whatever* be their extrasystemic interpretation. Such a linguistic or semantic version of mathematics was gradually developed by a group of thinkers, associated in one way or another with Cambridge.[25]

(1) *Woodhouse.*—It was Robert Woodhouse who, by his penetrating remarks on the nature of symbolic reasoning, laid the basis for the subsequent development of algebra.

> Operations with impossible quantities are really regulated by the rules of a logic equally just with the logic of possible quantities. . . . If operations with any characters or signs lead to just conclusions, such operations must be true by virtue of some principle or other; and the objections against imaginary

[25] The reader will not be surprised that a nominalistic bias characterized many members of this group. I do not believe, however, that such a bias is really consistent with the analysis of algebra which this school has contributed.

quantities ought to be directed upon the unsatisfactory explanation given of their nature and uses.[26]

Hence it was impossible to accept Playfair's weak defense of the use of imaginaries, namely, that they merely *suggested* conclusions which required to be *demonstrated* by more legitimate methods. For in what does demonstration consist anyway, he asked himself. His answer anticipates the logical developments of a century later:

> Demonstration is a method of shewing the agreement of remote ideas by a train of intermediate ideas, each agreeing with that next it; or, in other words, a method of tracing the connection between certain principles and a conclusion, by a series of intermediate and identical propositions, each proposition being connected into its next, by *changing the combination of signs that represent it, into another shewn to be equivalent to it.*[27]

Now reasoning with "imaginary numbers" follows exactly this procedure. For the characters denoted as "imaginary quantities" may be combined, by definition, in the same manner as the signs for "real quantities" can. Hence while the symbol $\sqrt{-1}$ does not represent a quantity, and while the "operations" of "addition" and "multiplication" upon it are not the *arithmetic* operations designated by the same names (since these latter are applicable to "real quantities" only), none the less it can be manipulated by

[26] "On the Necessary Truth of Certain Conclusions Obtained by Means of Imaginary Quantities," *Phil. Trans.*, Royal Society, 1801, p. 90. Woodhouse's implicit pragmatism comes out clearly in a letter to Baron Maseras: "Whether or not I have found a logic, by the rules of which operations with imaginary quantities are conducted, is not now the question; but surely this is evident, that, since they lead to right conclusions, they *must have a logic.*" Royal Astron. Soc., *Memoirs*, XII (1842), 462.

[27] *Ibid.*, p. 107. Italics not in text.

operations as thoroughly intelligible, as much deserving the name of reasoning, as any operations whatsoever.[28]

Woodhouse was thus committed to take the inevitable step. Not only is calculation with "imaginaries" as legitimate as with the ordinary signs for quantities, but such calculation depends *in no way* upon assigning to them a geometrical interpretation. They may represent, he tells us in effect, *anything whatsoever* which conforms to the formal conditions stated in the defining properties of the algebraical operations upon them. "That, in algebraical calculation, geometrical expressions and formulas are not essentially necessary, perhaps this short and easy consideration may convince us; since algebra is an universal language, it ought merely to be competent to express the conditions belonging to any subject of inquiry; and, if adequate expressions be obtained, then there is no doubt that with such, reasoning or deduction may be carried on."[29] While therefore expressions like *sin x*, which are borrowed from geometry, occur in algebra or analysis, they denote *within* the system of algebra nothing else than certain algebraic functions of x. It is only because such geometrical *expressions* are more commodious, typographically considered, than the corresponding analytical functions, that they are employed.

(2) *Peacock.*—However, it was in the writings[30] and un-

[28] Woodhouse shows clearly that the so-called "demonstrations" of the properties of negative and imaginary numbers (e.g., minus times minus equals plus), so common even in recent elementary texts, are fallacious. He takes special pains to point out that the equivalence between $(a + b\sqrt{-1}) \times (c + d\sqrt{-1})$ and $(ac + ad\sqrt{-1} + cb\sqrt{-1} - bd)$ must be *assumed*, and cannot be *proved* by the principles of arithmetic. *Ibid.*, p. 93. Cf. also his important *Principles of Analytic Calculation*, 1803, p. 8.

[29] "On the Independence of the Analytical and Geometrical Methods of Investigation," *Phil. Trans.*, Royal Society, 1802, p. 87.

[30] *A Treatise on Algebra*, 1830; "Report on the Recent Progress and Present State of Certain Branches of Analysis," *Report of British*

der the influence of George Peacock that these ideas were finally crystallized into explicitly formulated principles. The distinction between mathematics as a natural science, and mathematics as the science which investigates the necessary connections between premises and conclusions, is fundamental to all his thinking. He began his famous *Report* by commenting on the difference between sciences like algebra and geometry, which are founded on assumed principles and definitions alone, and the physical sciences which do not appeal to any such *ultimate* facts as foundations. In *applying* the mathematical sciences to these latter, he held we must *interpret* the principles and definitions as referring to physical things, so that the conclusions we obtain are true only within the limits of the truth and universality of our fundamental assumptions. For the conclusions of applied mathematics are not merely asserted to be implied by the premises, they are also asserted as being *true;* they can therefore be regarded as representing only approximately the actual state of affairs.[31]

Assoc. for the Advancement of Science, 1833; and *Treatise on Algebra,* Vol. I, 1842; Vol. II, 1845.

[31] *Report of the British Assoc. for the Advancement of Science,* Vol. III, p. 186. Peacock goes on: "In the speculative sciences, we merely regard the results of the science itself, and the logical accuracy of the reasoning by which they are deduced from assumed first principles: and all our conclusions possess a necessary existence, without seeking either for their strict or for their approximate interpretations in the nature of things; in the physical sciences, we found our reasonings equally upon assumed first principles, and we equally seek for logical accuracy in the deduction of our conclusions from them; but both in the principles themselves and in the conclusions from them, we look to the external world as furnishing by interpretation corresponding principles and corresponding conclusions; and the physical sciences become more or less adapted to the application of mathematics, in proportion to the extent to which our first principles can be made to approach to the most simple and general facts or principles which are discoverable in those sciences by observation or experiment. . . . It is true that there exists a connection between physical and specula-

If, then, mathematics as applied is *physics,* what is mathematics not applied? What is it that requires "interpretation" before questions of material truth may be significant, but which without "interpretation" may none the less be studied with regard to the connection between premises and conclusions? Peacock has supplied important answers to these questions, without raising them explicitly.

Peacock develops his views in several stages. Arithmetic and algebra, he points out, are two *distinct* sciences, although the latter is commonly, though mistakenly, believed to be based on the former. According to the usual view, the only difference between them is that algebra employs symbols in such a way that the properties of numbers (the subject matter of arithmetic) receive a perfectly general formulation. But this notion is soon found to be inadequate, Peacock suggests, when it is seen that the fundamental operations of arithmetic must be transformed and "enlarged" radically, if they are to be employed in algebra. Because of this, a clear distinction must be made between *arithmetical* and *symbolical* algebra.

The first of these sciences would be, properly speaking, *universal arithmetic:* its general symbols would represent numbers only; its fundamental operations, and the signs used to denote them, would have the same meaning as in

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tive geometry, as well as between physical and speculative mechanics; and if in speculative geometry we regarded the actual construction and mensuration of the figures and solids in physical geometry alone, the transition from one science to the other being made by interpretation, then speculative geometry and speculative mechanics must be regarded as sciences which were similar in their character, though different in their objects: but we cultivate speculative geometry without any such exclusive reference to physical geometry, as an instrument of investigation more or less applicable, by means of interpretation, to all sciences which are reducible to measure, and whose abstract conclusions, in whatever manner *suggested* or derived, possess a great practical value altogether apart from their application to practical geometry" (pp. 187-88).

common arithmetic; it would reject the *independent* use of the signs + and —, though it would recognize the common rules of their incorporation, when they were preceded by other quantities or symbols: the operation of subtraction would be *impossible* when the subtrahend was greater than the quantity from which it was required to be taken, and therefore the proper *impossible* quantities of such a science would be the *negative* quantities of *symbolical* algebra; it would reject also the consideration of the multiple values of simple roots, as well as of the negative and impossible roots of the second and higher degree: it is this species of algebra which alone can be legitimately founded upon arithmetic as its basis.[32]

Peacock thus laid the basis for distinguishing between a system of marks having an explicit *extrasystemic* reference, concerning which questions of truth and falsity are significant; and a system of marks with no such *explicit* extrasystemic interpretation, concerning which questions of truth are meaningless. And he offered an explanation of how an uninterpreted but general system of marks arises from the study of an interpreted system.

Arithmetical algebra must be distinguished from symbolical algebra, because certain operations, *always* permissible in the latter, are significant in the former only *under limiting conditions*. Thus, the expression $a - b$ is significant in arithmetical algebra only when $a > b$, and is meaningless when $a < b$, because it is not, and cannot be, defined in arithmetic. It cannot even be regarded as a "generalization" of the arithmetical relation of subtraction, since nothing within the subject matter of arithmetic corresponds to it. It is clear therefore that any theorem in arithmetical algebra involving the expression $a - b$ cannot be asserted uni-

[32] *Ibid.*, p. 189. The second edition of Peacock's *Treatise on Algebra* consequently appeared in two volumes, the first devoted exclusively to Arithmetical, the second to Symbolical, Algebra. Cf. II, 1 ff.

versally for all values of a and b; and mathematicians must put up with the great inconvenience of having to recognize exceptions to what *would* be perfectly general theorems *if* subtraction were an unrestricted operation. It seems but an easy step to allow the operation $a - b$ for all values of a and b, and mathematicians take it. But, and this is the heart of the matter, any mathematician taking it has left the *domain of arithmetic;* in strict logic, if not in imagination, he has assumed a rule for manipulating *marks* or *signs* whose extrasystemic interpretation cannot be integers or ratios of integers. Hence $a - b$, when a is less than b and "—" denotes arithmetical subtraction, is nonsense; it is a possible combination of signs when their extrasystemic meaning is not so restricted. *What* interpretation is to be be assigned to them need not be specified, and in any case may be postponed.[33]

Nevertheless, while arithmetic does not provide the *logical* foundation for symbolic algebra, it has a heuristic value in *suggesting* the principles (or laws of operation) of the latter. While in one sense the operations of symbolic algebra are arbitrarily assumed, in another sense they are not; except for the restrictions upon the range of their applicability, the operations of arithmetic obey the same *formal rules* of combination as do the algebraic ones. In arithmetic, however, Peacock holds, these rules are the necessary consequences from the definitions of integers and ratios. But when the symbols $+$, $\times$, $-$, $\div$, no longer represent operations upon integers, these rules "become *assumptions,* which are inde-

[33] *Ibid.,* p. 194. "Inasmuch as in many cases, the operations of Symbolical Algebra required to be performed are impossible, in their ordinary sense, it follows that the meaning of the operations performed, as well as of the results obtained under such circumstances, must be derived from the assumed rules, and not from their definitions or assumed meanings, as in Arithmetical Algebra" (*Treatise on Algebra,* II, 7).

pendent of each other, and which serve to define, or rather to *interpret* the operations, when the specific nature of the symbols is known; and *which also identify the results of those operations with the corresponding results in arithmetical algebra, when the symbols are numbers and when the operations are arithmetical operations.*"[34]

The important consequences of this approach to mathematics are obvious: (1) While in arithmetical algebra (the suggesting discipline), *a, b,* etc., represent integers or fractions, in the new science of symbolical algebra these signs *need not* represent integers or fractions, and in general will not be capable of being so interpreted. (2) But it is equally true that the signs of operation, +, —, etc., which in arithmetic denote the familiar addition, subtraction, etc., of integers, in the new science are signs which cannot in general be so interpreted. Only the formal properties of the possible operations which they represent, as stated by the rules of combination of these signs, are relevant to symbolical algebra. It is also strictly immaterial whether we can in fact find any suitable extrasystemic interpretation for them.[35]

[34] *Ibid.*, p. 197. He adds in a note: "To *define*, is to assign beforehand the meaning or conditions of a term or operation: to *interpret*, is to determine the meaning of a term or operation conformably to definitions or to conditions previously given or assigned. It is for this reason, that we *define* operations in arithmetical algebra conformably to their popular meaning, and we *interpret* them in symbolical algebra conformably to the symbolical conditions to which they are subject." Cf. also *Treatise*, II, 448-49.

[35] "The rules of symbolical combination which are thus assumed have been *suggested only* by the corresponding rules in arithmetical algebra. They cannot be said to be *founded* upon them, for they are not *deducible* from them; for though the operations of addition and subtraction, in their arithmetical sense, are applicable to all quantities of the same kind, yet they necessarily require a different meaning when applied to quantities which are different in their nature, whether that difference consists in the kind of quantity expressed by the unaffected symbols, or in the different signs of affection of symbols denoting the same quantity; neither does it necessarily follow that in such cases

What is the outcome concerning the nature of "pure" mathematics? Peacock indicates it clearly. When formally defined operations are symbolically denoted, certain "expressions" or "forms" are obtained, which are equivalent to other forms in virtue of the rules of the system of symbols. The discovery of these equivalent forms constitutes the principal business of algebra. This is the coping stone of the view that mathematics is primarily a language, concerned with certain formal relations, which are represented in the permissible combinations of a system of signs. It defines the function of the mathematician to be the application of formulas of translation, in virtue of which expressions symbolically different are found to be equivalent.[36]

But could not a symbolic algebra be constructed independently of any suggesting science, it may be asked. Is not the function of the suggesting science merely psychological, and does not the equivalence of forms in the algebra depend upon its *own* assumed general rules of operation? Peacock con-

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there *exists* any interpretation which can be given of the operations, which is competent to satisfy the required symbolical conditions" (*Ibid.*, p. 198). The heuristic principle, of taking the rules of operation of arithmetic as suggestions for developing an unrestricted symbolical algebra, was baptized by Peacock as the "principle of the permanence of equivalent forms." His formal statement of it is: "Whatever form is algebraically equivalent to another when expressed in general symbols, must continue to be equivalent whatever those symbols denote. Whatever equivalent form is discoverable in arithmetical algebra considered as the science of suggestion, when the symbols are general in their form, though specific in their value, will continue to be an equivalent form when the symbols are general in their nature as well as in their form" (p. 199). Cf. *Treatise*, II, 59. It must be clearly understood that this principle expresses a *resolution* for the construction of symbolical systems, and cannot be used, as Peacock was aware, to demonstrate the rules of combination in the new science. It is possible to construct algebras in which all the rules of common arithmetic do not hold. Cf. Peacock's discussion of multiplication of common fractions, *Treatise*, I, 74-5, or his discussion of the algebraic rules for signs, II, 18.

[36] *Report*, p. 198. *Treatise*, II, 449.

sidered the idea, only to reject it, because in that case "we should be altogether without any means of interpreting either our operations or their results, and the science thus formed would be one of symbols only, admitting of no application whatever."[37] This answer is far from being clear, since whether even a symbolical algebra derived from a suggesting science can find applications, is not guaranteed by the method used to construct it. At this point Peacock revealed a definite limitation in his outlook, a limitation, however, which was removed by other members of his school of thought. On one fundamental point, however, he saw clearly and truly: the possibility of interpreting extrasystemically the symbols of an algebra in no way affects the validity of the equivalences established by means of the formal rules of the combination of symbols which characterize that algebra.[38] It is this basic doctrine which is at the heart of modern logical theories, and which is the despair of their hostile critics.

(3) *Gregory.*—The distinction between "signs of operation" and "signs of quality," already prominent in the work of Peacock, continued to characterize the Cambridge group of mathematical thinkers.[39] This point of view dominated Boole completely, a consequence of his contacts with Duncan

[37] *Report*, p. 200. *Treatise*, I, vii.

[38] E.g., in discussing the imaginaries, he says: "The capacity possessed by the signs of affection involving $\sqrt{-1}$ of admitting geometrical or other interpretations, though it adds greatly to our power of bringing geometry and other sciences under the dominion of algebra, does not in any respect affect the general theory of their introduction: for, in the first place, it is not an essential or necessary property of such signs; and in the second place, it in no way affects the form or equivalence of symbolical results, though it does affect both the extent and the mode of their application" (*Report*, pp. 229-31).

[39] It is simply an error to assert that until Grassmann's work appeared in Germany, no study was devoted to the mathematical properties of operations, even if Hamilton is made an exception to this dictum. Cf. G. Stammler, *Der Zahlbegriff seit Gauss*, 1926, p. 52.

F. Gregory and DeMorgan. While both of these men were in substantial agreement with Peacock, their writings on this subject are of extraordinary interest, since they were more critically mature in the statement of their position than he was. It was Gregory's merit to have exhibited clearly the rôles of the commutative and the distributive laws. He died a young man, but he had succeeded in stating in a particularly fruitful way the principle of separating the signs of operation from other signs.

The light in which I would consider symbolical algebra is that it is the science which treats of the combination of operations defined not by their nature, that is, by what they are or what they do but by the laws of combination to which they are subject. And as many different kinds of operations may be included in a class defined in the manner I have mentioned, whatever can be proved of the class generally, is necessarily true of all the operations included under it. This does not arise from any analogy existing in the nature of the operations, which may be totally dissimilar, but merely from the fact that they are all subject to the same laws of combination. . . . We are thus able to prove certain relations between the different classes of operations, which, when expressed between the symbols, are called algebraic theorems. And if we can show that any operations in any science are subject to the same laws of combinations, the theorems are true of these as included in the general case: Provided always that the resulting combinations are all possible in the particular operation under consideration. For it may happen, that though each of two operations in a certain science may be possible, the complex operation resulting from their combination is not equally possible. In such a case, the result is inapplicable in that science.[40]

As an illustration, suppose, for example, F and f be any

[40] "On the Real Nature of Symbolical Algebra," *Edinburgh Phil. Trans.*, XIV, Part I (1838), 208.

two operations, whose *formal* nature is defined as follows, but about which nothing further is stated:

(I) $F\,F\,(a) = F\,(a)$ (III) $F\,f\,(a) = f\,(a)$
(II) $f\,f\,(a) = F\,(a)$ (IV) $f\,F\,(a) = f\,(a)$

These signs of operation may now be interpreted. If F and f denote the usual arithmetical operations of addition and subtraction respectively, then the above four relations state a part of their essential formal properties. But F and f may be interpreted differently: F may represent the translation of a point through the circumference of a circle, and f the translation through a semicircumference; this interpretation also "holds." Now while the arithmetical operations are clearly not identical with the geometrical ones, they do share certain formal properties of the latter. Hence, whatever can be proved of the symbolical operations F and f defined as above, is necessarily true of the arithmetic, geometric, or any other permissible interpretations which can be given them. It is not difficult to appreciate the fertility of the idea here sketched; and in fact the modern studies of structural invariance or isomorphism are illustrations of it.

(4) *DeMorgan.*—DeMorgan, like Boole, not only made fundamental contributions to theoretical logic, but was a pioneer in establishing the nature of pure mathematics and symbolic algebra. Like others of his time, he found the usual discussions of algebra "absurdly incorrect," and devoted much effort to establishing that science on a sound basis. It soon impressed itself upon him that the unrestricted use of "operations" represented by words or other signs was an essential feature of mathematics, and that many of the difficulties in algebra were simply the consequences of a careless use of the *language* of mathematics. For words as well as other symbols, though of our own making, are treacherous

things, and we often draw conclusions from one meaning of a symbol only to apply them to other, often incompatible, meanings.[41] It was particularly important in algebra, he found, to keep distinct the intrasystemic meanings of signs (their syntax, or modes of combination) from the extrasystemic interpretation which may be given them. Accordingly, he recognized two distinct parts of algebra, the technical, and the logical.

Technical algebra is the art of using symbols under regulations which, when this part of the subject is considered independently of the other, are prescribed as the definitions of the symbols. Logical algebra is the science which investigates the method of giving meaning to the primary symbols, and of interpreting symbolical results.[42] . . . The first step to logical algebra is the separation of the laws of operation from the explanation of the symbols operated on or with.[43]

If "pure" mathematics is to be identified as a science which is free from the necessity of making material or empirical assumptions, can "pure" mathematics be recognized in either one of these distinctions? It surely cannot be the process of interpreting extrasystemically the symbols of algebra; for such a process must certainly make empirical assumptions when it interprets the symbols as representing properties found in spatial or temporal contexts. Even when

[41] DeMorgan, *Elements of Algebra*, 2d ed., 1837, pp. 54-59.
[42] "On the Foundations of Algebra," *Trans. of Cambridge Phil. Soc.* VII (1839), 173. DeMorgan continues: "It is desirable that the word *definition* should not enter in two distinct senses, and I should propose to retain it as used in the *art* of algebra, applying the terms *explanation* and *interpretation* to denote the preparatory and terminal processes of the *science*. Thus a symbol is *defined* when such rules are laid down for its use as will enable us to accept or reject any proposed transformation of it, or by means of it. A simple symbol is *explained* when such a meaning is given to it as will enable us to accept or reject the application of its definition, as a consequence of that meaning."
[43] *Ibid.*, p. 287.

the symbols are taken as standing for relational properties or "essences," like cardinal and ordinal numbers, the structure of classes, etc., material assumptions are needed at *some* point *if* these relational properties are equated with the highly abstract characters of spatio-temporally situated things. If, however, we understand by "technical" algebra not simply the actual manipulation of symbols, but also the analysis of the structure of symbolic systems, it is possible to recognize it as coinciding, in good part at least, with what is usually designated as pure mathematics. Since the difference between technical algebra (or pure mathematics) and logical algebra (or applied mathematics) is fundamental to the discussion of this paper, I shall let DeMorgan state concretely the distinction, without apologizing for the length of the quotation.

Nothing can be clearer than the possibility of dictating the symbols with which to proceed, and the mode of using them, without any information whatever on the meaning of former, or the purpose of the latter. A person who should learn how to put together a map of Europe dissected before the paper is pasted on, would have symbols, various shaped pieces of wood, and rules of operation, directions to put them together so as to make the edges fit, and the whole form an oblong figure. Let him go on until he can do this with any degree of expertness, and he has no consciousness of having learnt anything: but paste on the engraved paper, and he is soon made sensible that he has become master of the forms and relative situations of the European countries and seas.

As soon as the idea of acquiring symbols and laws of combinations, without given meaning, has become familiar, the student has the notion of what I will call a *symbolic calculus;* which, with certain symbols and certain laws of combination, is *symbolic algebra:* an art, not a science; and an apparently useless art, except as it may afterwards furnish the grammar of a science. The proficient in a symbolic calculus would naturally demand a supply of meaning. Suppose him left

without the power of obtaining it from without. His teacher is dead, and he must *invent meanings* for himself. His problem is, Given symbols and laws of combination, required meanings for the symbols of which the right to make those combinations shall be a logical consequence. He tries and succeeds; he invents a set of meanings which satisfy the conditions. Has he then supplied what his teacher would have given, if he had lived? in one particular, certainly: he has turned his *symbolic* calculus into a *significant* one. But it does not follow he has done it in the way his teacher would have taught him, had he lived. It is possible that many different meanings may, when attached to the symbols, make the rules necessary consequences. We may try this in a small way with three symbols, and one rule of connexion. Given symbols M, N, $+$, and one sole relation of combination, namely that $M + N$ is the same as $N + M$. Here is a symbolic calculus: how can it be made a significant one? In the following ways, among others. 1. M and N may be magnitudes, $+$ the sign of addition of the second to the first. 2. M and N may be *numbers,* and $+$ the sign of multiplying the first by the second. 3. M and N may be lines, and $+$ the direction to make a rectangle with the antecedent for a base, and the consequent for an altitude. 4. M and N may be *men,* and $+$ the assertion that the antecedent is the brother of the consequent. 5. M and N may be *nations,* and $+$ the sign of the consequent having fought a battle with the antecedent.[44]

Algebra, conceived as pure mathematics, is therefore a science which studies equivalences between symbolic expressions, by virtue of their structure specified as relevant by the rules of the system. By reducing the extrasystemic references of its symbols and isolating their syntactical meanings, mathematics has grown from having been the science of

[44] *Trigonometry and Double Algebra* 1849, pp. 92-93. Later on, apropos of the signs for addition and subtraction introduced in symbolical algebra, he says: "If any one were to assert that $+$ and $-$ might mean reward and punishment, and A, B, C, etc. might stand for virtues and vices, the reader might believe him, or contradict him, as he pleases—but not out of *this* chapter" (p. 101).

quantity to becoming the science which explores the most abstract properties of any subject matter whatsoever.

IV

No account of the growth of modern mathematics and logic can be given without including the contributions of Sir William R. Hamilton.[45] It is in large measure his work that is responsible for the freeing of symbolical algebra from the too great reliance upon arithmetic which characterized Peacock's views. Although Hamilton belongs, in a sense, to the group of thinkers discussed above, who insisted upon the indispensability of an extrasystemic interpretation of algebra, he had many points of contact with the symbolical approach. His opposition to regarding mathematics merely as a language, helps to throw into relief the essential features of that philosophy of mathematics.

As in the case of his contemporaries, it was the paradoxical nature of "negative" and "imaginary quantities" which led Hamilton to the examination of the foundations of mathematics. He soon found himself in agreement with those who held that these did not represent quantities at all. But he was dissatisfied with the theory which regarded them as

[45] It is perhaps unnecessary to remind the reader that it is not the *Scotch* Hamilton to whom reference is made here. The two have been confused even by their contemporaries. Corresponding with the *Irish* Hamilton anent his well known controversy with the Scotch Hamilton, DeMorgan wrote: "The party making the charge [plagiarism] is your namesake, Sir Wm. Hamilton of Edinburgh. If I cannot drive him to press in a week or two . . . I must publish myself; so that all will soon be out. In the meanwhile I send you this information that you may not stare if anybody tells you that *you* are charging me with stealing logic from you. . . . I was talking to a friend on this matter the other day, and I said to him, 'You know Sir W.H. is no mathematician—in fact he is an opponent of mathematics.' I saw my friend's eyes open very wide, and he looked to see if I were gone mad—I had forgotten to say 'of Edinburgh.' " *Life of Sir Wm. Rowan Hamilton,* by Robert P. Graves, Dublin, 1882-89, III, 266.

representing directed segments; and he could not accept for his own the linguistic analysis of their nature. What alternative besides the one already discussed remained for him?

Hamilton was a friend of Coleridge and Wordsworth and, inspired by the former, took to reading Kant. It was under the influence of the transcendental aesthetic that his views on algebra matured.[46] In a series of letters at about this time to his friend Lord Adare, he stated his ideas clearly. In arithmetic, he explained, number is the answer to the question "How many"; in metrology, the science of measure, it is to the question "How much"; but in algebra, number answers the question "How placed in a succession." Algebra, and in fact every subdivision of mathematics, is therefore the science of order, progression, or "pure Time."[47] It was possible to belong to three different schools of thought concerning the nature of mathematics: to the theoretical, the philological, or the practical, according as one chiefly aimed at clearness of thought, symmetry of expression, or ease of manipulation of symbols. Hamilton included himself in the first group "as seeking a clear and lively intuition, by whatever cost of meditation or mental discipline."[48]

On the one hand, therefore, Hamilton denied that algebra was a mere play with contentless signs; but on the other hand, he was equally insistent that no empirical or material knowledge was required to cultivate it.[49] If, however, we regard pure mathematics as dependent upon our a priori intuitions of time, mathematics will at once be a non-empirical science and also have a "content," namely "pure Time." But it was quite evident that what Hamilton meant by "pure Time," was nothing other than abstract order, or as he put

[46] *Ibid.*, Vol. II, Chaps. XVII, XVIII. Cf. p. 141.
[47] *Hermathena*, Vol. III (1879). Letter of March 4, 1835.
[48] *Ibid.* Letter of March 13, 1835.
[49] *Life*, II, 343.

it, "order in continuous progression." In any case, he was able to show in his famous essay on "Algebra as Pure Time" (by taking the notion of serial order or time as primary, and by representing "points of Time" by real numbers, "steps" or intervals of time by a "couple" or pair of numbers) how negative and imaginary "numbers" may be regarded as conventional representations of certain *relations* between pairs of numbers.[50] While Hamilton's discussion of the nature of these "steps" in time is not free from serious difficulties, his method (of considering certain relations between *sets* of two numbers each) has remained the most satisfactory approach to the analysis of fractional, negative, and imaginary "numbers" in terms of relations between integers.[51]

Hamilton subsequently turned to the investigation of an algebra of triples, or sets of three numbers; and later, of a generalized algebra of sets of n numbers each. But he found that while the "subtraction" and "addition" of triplets could be subsumed under the formal rules for the "subtrac-

[50] "The Theory of Conjugate Functions, or Algebraic Couples, with a Preliminary Essay on Algebra as the Science of Pure Time," *Trans.*, Royal Irish Academy, Vol. XVII, 1837. He regarded the conclusion that "pure Time" was essential to algebra as an induction from the history of mathematics. "The history of Algebraical science shows that the most remarkable discoveries in it have been made, either expressly through the medium of the notion of *Time*, or through the closely connected (and in some sort coincident) notion of *Continuous Progression*. . . . Lagrange, in the Philologic spirit, sought to reduce the Theory of Fluxions to a system of operations upon symbols, analogous to the earliest symbolical operations of Algebra, and professed to reject the notion of time as foreign to such a system; yet admitted that fluxions might be considered only as the velocities with which magnitudes vary. . . . Lagrange considered Algebra to be the *Science of Functions*, and it is not easy to conceive a clearer or juster idea of *Function* in this Science, than by regarding its essence as consisting in a *Law connecting Change with Change*. But where *Change* and *Progression* are, there is *TIME*" (p. 295).

[51] Hamilton gives a brief account of these investigations in the Preface to his *Lectures on Quaternions*, 1853, p. 10.

tion'' and ''addition'' of couples, ''multiplication'' of triplets presented grave difficulties. Only after fifteen years of thought did he hit upon a successful rule for performing it; he was so elated at his discovery that he carved the result on a wooden bridge upon which he was passing at the time. He had been trying to find a spatial interpretation for the triplets and the operations upon them, but all those he could think of required abandoning the distributive law of multiplication; the inconveniences in calculation which resulted made this prohibitive. But now he hit upon a rule of multiplication for which the distributive law held, although it was necessary to give up the commutative principle.[52] This was the beginning of the theory of quaternions. For the first time an algebra was discovered with an indisputably useful geometrical interpretation, which illustrated a set of principles of operation radically different, even formally, from the operations of arithmetic and the algebras suggested by arithmetic. Mathematics had really come into its maturity as the science of the abstract structure of anything whatsoever.

How profound were Hamilton's differences with the linguistic school? He himself indicated that they were not far-reaching, and that his ''pure Time'' could be viewed as a *suggesting* science, in Peacock's sense, for constructing a symbolical algebra, whose extrasystemic interpretation could then be neglected. It was because the linguistic approach did not afford him an adequate intuition of *number* that he was compelled to dissent from it.

I confess I do not find myself able to form a distinct *conception* of number, *without some* reference to the thought of *time,* although this reference may be of a somewhat abstract and transcendental kind. I cannot fancy myself as *counting*

[52] *Ibid.,* Preface, pp. 18-61.

any set of things, without first *ordering* them, and treating them as *successive:* however arbitrary and mental (or subjective) this assumed succession may be.[53]

On this question, present discussion is still not unanimous, and the issues cannot even be presented here. One thing seems clear, however. If *pure* mathematics logically requires the notion of number which is the structure of *counted things,* then not only must the idea of *order* be taken as one of the primitive underived ideas in all mathematics (a conclusion which follows on independent grounds as well); but also what is called pure mathematics must be logically dependent upon assumptions and notions which are empirical in nature as well as in origin.

In spite of this divergence, Hamilton saw the difference between himself and the Cambridge school progressively diminish.

I feel an increased sympathy with, and fancy that I better understand, the Philological School [he wrote his friend Robert Graves in 1846]. It enables me to see better than before the high functions of language, to trace more distinctly and more generally the influence of signs over thoughts, and to understand an answer which I hazarded some years ago to a question of yours, What did I suppose to be the *Science of Pure Kind?* namely, that I supposed it must be the *Science of Symbols.*[54]

And to Peacock he wrote the same year,

My views respecting the nature, extent and importance of symbolical science may have approximated gradually to

[53] *Ibid.,* p. 15. Cf. also his comments on Ohm, a member of the symbolic school, *Life,* II, 417: "*Ordinals* seem to me to have, in thought, priority over *cardinal* numbers: 'one,' 'two,' 'three,' mean *originally,* 'first,' 'second,' 'third;' they are names rather of the counted things, than of the groups containing them; and thus even in answering the question:—How many? we undoubtedly bring in the question, and its answer: Which in a progression?"

[54] *Life,* II, 522.

yours. . . . [But] I still look more and more habitually *beyond* the symbols than they [the Cambridge school] would chose to do. To use DeMorgan's image, I turn up the fronts of the bits of the dissected map, and try to learn what countries they denote, as well as how they fit together.[55]

V

It was against the background of the ideas whose growth has been sketched, that Boole developed his mathematical formulation of traditional logic. He was on terms of acquaintance with the leading figures of contemporary English mathematical research.[56] Gregory was his friend, and Boole's first mathematical paper appeared in the *Cambridge Mathematical Journal* for 1840, when Gregory was its editor. Boole was in correspondence with Gregory until the latter's death, and Gregory acted as mentor to the younger man. It is not surprising, therefore, that Boole used the ideas of the Cambridge group as leading principles in his own researches.

The notion of one branch of science acting as a "suggesting science" for developing another, as well as the notion of separating signs of operation from other signs, dominated Boole's mathematical writings, as readers of his *Differential Equations* know.[57] They were also the leading principles, in slightly altered form, in the development of his logical sys-

[55] *Ibid.*, p. 528. He adds: "When I first read that work, . . . it seemed to me, I own, that the author designed to reduce algebra to a mere system of symbols, and *nothing more;* an affair of pothooks and hangers, of black strokes upon white paper, to be made according to a fixed but arbitrary set of rules: and I refused to give the high name of *Science* to the results of such a system; as I should, even now, think it a stretching of courtesy, to speak of chess as a 'science,' though it may well be called a 'scientific game.' "

[56] *Ibid.*, p. 575.

[57] Boole, *Differential Equations*, 2d ed., Cambridge, London, 1865, p. 398.

tem, as he himself acknowledged.[58] Indeed, he found that the rules of combination for signs of logical operation were the same as those of an algebra of the numbers *1* and *0;* and one of the blemishes of his procedure is that he did not consistently distinguish between the development of such an abstract algebra, and the interpretations which could be given to its terms. The details of Boole's algebra as well as of his difficulties in interpreting each of its processes, are too well known to need a statement here.

It was very fortunate that the theory of symbolic algebra had been worked out far enough, so that the validity of any deduction in Boole's system was generally acknowledged *not* to depend upon the possibility of giving any specific extra-systemic interpretation to it. For, strange irony of history, Boole believed himself in his logical writings to be symbolizing the laws of mental processes.

> The design of the following treatise [he said on the opening page of *The Laws of Thought*], is to investigate the fundamental laws of those operations of the mind by which reasoning is performed; . . . and to collect from the various elements of truth brought to view in the course of these inquiries some probable intimations concerning the nature and constitution of the human mind.

He spent much time in reading and reflecting on psychology, so that "mental science became his study and mathematics were his recreations."[59] There is at least a grain of truth in his wife's contention that Boole believed *The Laws of Thought* to be "really about brain-action"—a work on psychology, not a mathematical text; and that in studying the

[58] Cf. the extract from an undated manuscript of Boole, quoted by Jourdain, *Quarterly Journal of Pure and Applied Mathematics,* XLI, 346. Also, Boole *Math. Analysis of Logic,* London, 1847, pp. 3-6.

[59] R. Harley, in a brief biographical account of Boole, in *British Quarterly Review,* XLIV, 157.

mathematics of the action of the brain we are studying and conversing with God.[60]

By virtue of the theory of symbolical algebra, however, it is not necessary to determine what Boole thought was *one* possible interpretation of his logical calculus. It *may* be that it expresses certain abstract aspects of the Infinite, the Absolute, and the Eternal, as his wife said; but its merits as a calculus of logic do not depend on this being or not being the case. Boole himself was clearly aware that no guarantee can be given that a symbolic calculus has a *unique* extra-systemic interpretation; there cannot be a subject matter of which it may be said that the calculus is "really about *it*" and about nothing else.

It is for this reason that Boole's work in logic is not simply a mystical excursion into transcendental metaphysics, or simply an interesting variety of an abstract algebra. For when the symbols of *The Laws of Thought* are interpreted as classes, propositions, and certain relations between them, this work becomes *their* theory, it formulates the structure of *their* relations to one another. As an uninterpreted, abstract algebra it exhibits certain analogies, in respect to the abstract structure of the operations employed, with ordinary algebra and with many other disciplines. As a calculus of classes or of propositions, although the rules of its operations may have been *suggested* by those of ordinary "quantitative" algebra or by the study of the Absolute and the Eternal, the formal similarities that it exhibits with other subject matters must be regarded as at least a contingent matter of fact.[61]

[60] Mary Everest Boole, *Boole's Psychology*, as a Factor in Education, Colchester, 1902, pp. 19 ff. Florence Daniel, *A Teacher of Brain Liberation*, 1923, p. 10.

[61] *Laws of Thought*, London, 1854, pp. 6-7.

VI

How contemporary discussions reflect and extend the ideas whose growth has been sketched, is too large a theme for the tail end of an historical essay. A bare reference to the writings of Peirce and Lewis in America, of the Wittgensteinized Russell in England, and of Hilbert and the logical positivists on the Continent, will perhaps suffice to indicate the fact that in current logical researches the study of the syntactical structure of signs has not diminished in importance.[62] Indeed, preoccupation of philosophers with the nature of symbolism is neither an isolated contemporary phenomenon, nor confined to the English logicians of the nineteenth century. The insights that discursive knowledge is necessarily symbolical and that language is its instrument, that the structure and rationality of the world become ex-

[62] For example, swerving away from his earlier Platonic theory of logic and mathematics, Russell now declares that propositions of logic and mathematics "are really concerned with symbols. We can know their truth and falsehood without studying the outside world, because they are only concerned with symbolic manipulations." *Analysis of Matter,* London, New York, 1927, p. 171. And a recent handbook summarizes Hilbert's views as follows: "Pure logic and mathematics are calculi in which the essential thing is the derivation of a set of expressions or formulas from certain initial formulas by means of fixed rules of operation." W. Dubislav, *Phil. der Mathematik in der Gegenwart,* Berlin, 1932, p. 47.

It need scarcely be said that this approach to logic and mathematics must be supplemented by a careful examination of the different senses in which the word "sign" or "symbol" is employed. It is patent, for example, that one must distinguish between the *type* or *kind* of a sign, and its *hic et nunc* spatio-temporal exemplification. Thus a formula is derivable from a set of initial formulae, not because of the *hic et nunc* distribution of marks on a piece of paper, because of the *type* of such distribution. Peirce seems to be the only one who has taken the trouble to make the requisite analysis of signs. Hilbert's distinction between "mathematics" (or the manipulation of marks), and "meta-mathematics" (or the principles governing and limiting such manipulation), is also relevant in this connection.

pressed and communicated in language, and that without systems of symbols logic can neither be nor be conceived, are hardly of so recent a date.

The theory that pure mathematics and logic are abstract calculi, may not be the last word of wisdom on the subject, but it surely should be among the first. A careful examination of its consequences shows that it makes possible a philosophy of logic able to avoid well charted reefs and whirlpools of general philosophy: a crude psychological empiricism, a romantic mental creativism, and an extreme form of Platonic realism.

1. It must by now be too evident to require many more words, that the validity of any deduction in a symbolic algebra cannot depend upon the material interpretation which may be given to the symbols of the calculus. Expressions are equivalent in a system of pure algebra, by virtue of the rules for combining the elements of the system *whatever* be the interpretation which may satisfy them. Hence the validity of any formal deduction can never be a matter for any experimental test which appeals to some extrasystemic procedure. It is true, of course, that the operations of an abstract algebra are often so devised as to symbolize certain pervasive invariants in different subject matters. But this point raises different issues, to which reference will be made below. Meanwhile, however, the theory of pure mathematics here stated clearly must reject the naïve view that the theorems of pure mathematics are simple inductions from experience.

2. It is sometimes asserted that mathematics and logic are free creations of the human mind, so that it is we who invent and build up towering intellectual systems, unchecked by anything save our fancy. Now indeed if by mathematics we understand *pure* mathematics, the construction and develop-

ment of abstract symbolical structures, this is true in a large measure. We are free to select one aspect rather than another of the symbols or marks we employ as being relevant to the game of algebra we employ, just as we are free to attend to the *shapes* of chessmen and not to the *material* out of which they are made. We are in a measure free to decide upon how many distinct elements shall be incorporated into a symbolic calculus. We are also free in a measure to agree upon one convention rather than another for manipulating the symbols, just as we are free to decide upon what shall be the permissible moves for the knight in chess.

But this freedom is restricted in various ways. In the first place, this freedom, such as it is, is confined to building up an abstract, uninterpreted calculus. It well-nigh disappears, in any significant sense, when an algebra is "invented" which aims to represent invariant features in some subject matter. In the second place, the *material* quality of the symbols we employ itself imposes restrictions: thus, symbols confined to one plane cannot have rules of combination imposed upon them which require a three-dimensional space as a field of operation. And finally, the rules for manipulating the symbols must be consistent with one another, and with the number of distinct symbols arbitrarily assumed for the algebra. For when certain conventions are arbitrarily made about the manipulation of symbols, the consequences of these conventions are not themselves arbitrary or conventional.

3. According to a well-known view, pure mathematics and logic aim at being true in all "possible" worlds, not only in the "chance" world in which we find ourselves; and further, it is urged that so far as pure logic is concerned, the existence of the world is an "accident." Unfortunately, "possibility," "chance," and "accident" are weasel words; and the important truth which is asserted in these dicta is not

seldom translated to mean that mathematical and logical principles are imposed upon the flux of things in some sense *ab extra*. It is easy to conclude, consequently, that certain pervasive characters in nature can be deduced or derived, without any empirical study of the flux, from the fundamental principles of "pure logic." What light is thrown upon this issue by the analysis of pure mathematics as the structure of symbolic systems?

It is essential to note that when the symbols of an abstract language are given an extrasystemic interpretation, the result is *applied* mathematics. This is the case whether the interpretation makes the symbols stand for physical things and their relations, or for certain "essences" or logical entities. For the first alternative this is obvious, and, in addition, in *this* case the applied mathematics is a *natural* science. As for the second alternative, it is often forgotten that in interpreting an abstract algebra as a calculus *of* certain logical or mathematical entities, we are none the less performing an *interpretation,* which may be a mistaken one. But there is something more important: If such "essences" or logical entities are conceived as capable of being equated with the structures of empirical situations (e.g., cardinal numbers understood as being the relational structures of the familiar empirical counting processes), then material assumptions are involved in supposing them identical with certain pervasive characters found in empirical situations; and this is so even though such essences are generic traits involving a high level of abstraction. For it is usually admitted that "logical traits" represent elements of structure possessing the utmost generality possible, which are therefore pervasive in *all* subject matter.

It follows that pervasive characters of nature cannot, without a circular argument, be derived a priori from logical ab-

stracta, since the latter are simply what we apprehend as the pervasive characters of the flux. The derivation of mathematics from logic cannot therefore be interpreted as the deduction of material principles from non-empirical ones, or as the derivation of a "content" from the structure of that content. The identification of pure mathematics with logic, if it does not simply mean that both are calculi with uninterpreted symbols, can mean only that the same types of abstract relations are discoverable in the former as in the latter.

It is no mystery, therefore, that pure mathematics can so often be applied. Many branches of pure analysis, it is evident from the preceding historical survey, are developed on the basis of "suggesting sciences," whose fundamental notions, even though highly abstract, are yet drawn from observation of the natural world. It is a reasonable hypothesis, that pure mathematics in general is so often applicable, because the symbolic structures it studies are all suggested by the natural structures discovered in the flux of things. Their symbolical statement and development liberates us from the press of local circumstance, and permits us to extrapolate invariant relations found in one segment of the flux to another. Santayana writes, with characteristic penetration,

> Inapplicable mathematics, we are told, is perfectly thinkable, and systematic deductions, in themselves valid, may be made from concepts which contravene the facts of perception. We may suspect, perhaps, that even these concepts are framed by analogy out of suggestions found in sense, so that some symbolic relevance or proportion is kept, even in these dislocated speculations, to the matter of experience.

One parting word of caution must be said. Preoccupation with language and other symbolic structures has often gone hand in hand with the denial of the "reality" and objec-

tivity of kinds and structures. But such a nominalism is by no means necessary to the analysis of pure mathematics here stated. *If* a calculus *does* apply, it does apply only because the structure of the system of symbols *expresses* the structure of the subject matter it deals with. Symbols and the relations between them have no magical power of being able to *represent* what does not in fact exist to be represented. Just as "knowledge is in a way identical with the objects of knowledge," so, to paraphrase Aristotle, a language which expresses truly is in a way identical with what is expressed—it is identical with it in its structure.

Whatever be the weaknesses of this theory of mathematics, therefore, its great merit lies in its insistence that the principles of any subject matter can be discovered in no other way (however such principles may be *suggested* to us) than by examining *that* subject matter. It makes the modest claim that in the procedure of pure mathematics itself may be found a hint of how to bridge the often-seeming unbridgeable chasm between the non-empirical sciences and the sciences of nature.

THE PRAGMATIC NATURALISM OF CHAUNCEY WRIGHT

GAIL KENNEDY

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In his brief sketch of American philosophy since the civil war Professor Morris Cohen characterizes the thought of Chauncey Wright as anticipatory of the pragmatism of James and the instrumentalism of Dewey.[1] Again, in the preface to his edition of Peirce's essays, he asserts: "There can be little doubt that Peirce was led to the formulation of the principle of pragmatism through the influence of Chauncey Wright."[2] And in estimating Wright's importance he says: "If the test of a philosopher be intellectual keenness and persistent devotion to the truth rather than skill in making sweeping generalizations plausible, Chauncey Wright deserves a foremost place in American philosophy."[3] This estimate of Wright's ability was shared by the men who knew him best and upon whom he apparently had great influence. Peirce considered him "a mind about on the level of J. S. Mill."[4] John Fiske, who also compared him with Mill, asserts that "an intellect more powerful from its happy union of acuteness with sobriety has probably not yet been seen in America."[5] And finally we may cite James's opinion: "If power of analytic intellect pure and simple could suffice,

[1] *The Cambridge History of American Literature,* New York, 1917-23, III, 235.
[2] Charles Sanders Peirce, *Chance, Love and Logic,* London, 1923, p. xviii.
[3] *Op. cit.,* p. 234.
[4] Letter to Mrs. Ladd Franklin, *Journal of Philosophy,* XIII, 719.
[5] John Fiske, *Darwinism and Other Essays,* Boston & New York, 1896, p. 83.

the name Chauncey Wright would assuredly be as famous as it is now obscure, for he was not merely the great mind of a village—if Cambridge will pardon the expression—but either in London or Berlin he would, with equal ease, have taken the place of master which he held with us."[6] There can be no doubt, then, of Chauncey Wright's originality and ability, nor, in view of the striking influence he had upon his younger contemporaries, Peirce and James, of his historical importance.

Wright is thus a transitional figure who points the way to the development characteristic of contemporary philosophy. He came to maturity at a period when the theory of evolution was transforming the categories of an age. There were those who, like Agassiz, from the serene heights of Platonism dismissed the Darwinian hypothesis with contempt as "a mania to be outlived."[7] But an increasing majority turned to an easier way out, that of Asa Gray, who attempted to treat Darwin's facts as so many evidences of design on the "installment plan."[8] The popular leaders of this new cult of evolution were Spencer and his disciple, John Fiske. Fiske restored natural theology by giving currency to the myth that everything has a function, a use, and undergoes a process of continued development toward an ideal end. This easy transformation of Spencer into a system of theology, making man's spiritual development the goal of the whole evolutionary process, met with an immense response in a country whose faith in progress is proverbial. But while the pietistic reading of evolution gained a stronghold in popular opinion, it did not mislead everyone. "There are," remarks Santay-

[6] William James, *Collected Essays and Reviews*, New York, 1920, p. 20. Darwin also held Wright in great esteem. See below, p. 492, n. 37.
[7] Woodbridge Riley, *American Thought*, New York, 1915, Chap. VII.
[8] Professor Dewey's phrase. *Influence of Darwin*, New York, 1910, p. 12.

ana, "materialists by instinct in every age and country; there are always private gentlemen whom the clergy and professors cannot deceive."[9] Chauncey Wright was such a gentleman; he frankly and unequivocally accepted Darwinism at its face value and proceeded to work out its real implications for philosophic thought. Equipped with a sound knowledge of mathematics and physics, fresh from a penetrating study of Whewell and Mill, he turned to Darwin's work, and made himself thoroughly conversant with both Darwin's facts and his methods of inquiry. Viewing Darwin's researches as they should be viewed, in the same naturalistic way in which they were conceived and executed, Wright attained more than an inkling of the truly revolutionary consequences involved.

Of Wright's influence, almost wholly the direct effect of his conversation, only meager and fragmentary indications survive in his correspondence, articles and reviews. But it is, I believe, worth while to attempt to write what is a brief but significant chapter in the history of American thought.

I

The life of a retired philosopher is usually the simple record of the growth and publication of his thought. Chauncey Wright's career is an extreme instance of this quietistic retrenchment. He was born at Northampton in 1830 and died prematurely at Cambridge in 1875. After graduating from Harvard College he became a computer for the nautical almanac, continuing to support himself in this way until five years before his death. To eke out his income he took an occasional private pupil and for a while taught natural philosophy at Professor Agassiz's school for young ladies in Cambridge. In 1860, because of his repute as a mathema-

[9] *Character and Opinion in the United States,* New York, 1920, p. 23.

tician and physicist, he was elected a member of the American Academy of Arts and Sciences, becoming its recording secretary from 1863 to 1870. A few scientific papers were contributed by him to the proceedings and memoirs of the Academy. In 1870 he was invited to give a course of university lectures on psychology, and at a later date for a short while was instructor in mathematical physics at Harvard College. During the last fifteen years of his life he contributed occasional articles, most of them reviews of books concerning the theory of evolution, to the *New York Evening Post*, the *North American Review*, and the *Nation*.[10]

Neither as teacher nor as writer were those qualities of his conversation evident to which most of his influence has been due. Lecturing and writing were for him a form of soliloquy. Hence his published work has an eliptical quality which makes it difficult to understand. While his style possesses a certain hard brilliant dryness and is frequently epigrammatic, it contains little metaphor or illustration and shows no particular arrangement or emphasis. His most pregnant ideas are often expressed with casual abruptness as mere asides. Everything is put, as it were, on a dead level and the reader must sift out the meaning for himself. "What I write," he said, "usually contemplates an imaginary company of sages or experts, and requires to be read deliberately, and sometimes twice."[11] Wright carried this esoteric quality in his style so far that he even contemplated calling his essay on the evolution of consciousness "The Cognition of Cogito."

A man of great natural indolence, and irregular habits,

[10] All of Wright's important essays were published posthumously under the title, *Philosophical Discussions* (New York, 1876), with a biographical sketch by Charles Eliot Norton.

[11] *Letters of Chauncey Wright*, Cambridge, 1878. With some account of his life by James Bradley Thayer.

with little aptitude for study and writing, he was, as James remarks, "more a philosopher of the antique or Socratic type than a modern 'Gelehrter!' "[12] "Writing and artificial memory," he remarked in a letter, "are often, I think, in the way of a better sort of memory which holds what is worth retaining by more real ties." While as for reading: "A cold thesis, served in a book, does not incite the speculative appetite with me; and I confess to the heartiest sympathy with Plato's preference for a *man,* who can question and answer, rather than for a book, which must say much at random, or demand an artist's skill and imagination in the writer."[13] Hence, though possessed of a tenacious memory, Wright's mind never became debauched by learning; he was not tempted to become engrossed by any form of "busy" work, and with a great passion for truth, was forever brooding and pondering over his ideas. The results emerged in his conversation, and for conversation he was always ready. "An evening's talk with him," says Fiske, "always seemed to me one of the richest intellectual entertainments, but there was no telling where or how it would end."[14] Among congenial associates almost any remark would set him off and once going he was like a good clock, always fresh for a new start at midnight. Combined with this truly antique enthusiasm for ideas went the candor and impartiality of mind that characterizes a lover of the true. Wright was never tempted covertly to hypostatize his heart's desire. "Whereas," says James, "most men's interest in a thought is proportional to its possible relation to human destiny, with him it was almost the reverse."[15] And in this

[12] James, *op. cit.,* p. 21.
[13] *Letters,* p. 140.
[14] Fiske, *op. cit.,* p. 107.
[15] James, *op. cit.,* p. 23.

judgment Fiske concurs: "Judicial candour and rectitude of inference were with him inborn."[16]

Wright is an outstanding example of the immense amount of intellectual stimulation which may be gained from the mastering of a few really great books. What he did read was so thoroughly ingested that it became a part of his intellectual constitution and is an essential clue to the development of his thought. In college days Emerson was his favorite author. Soon after graduation, in 1856, he took to reading Bacon and Whewell. It was Bacon who first interested him in philosophy. The Baconian distrust of anticipations of nature, and corresponding faith in the universal applicability and validity of the empirical methods of science became and remained the central outlook of Wright's philosophy. From Whewell he absorbed an extensive knowledge of the history of science, corroborative of this Baconian presumption. The next great formative influence on Wright's mind was Hamilton. To Hamilton's system he became for a while a devoted convert. Much in Hamilton was antagonistic to Wright's tough-minded temperament, but it was always characteristic of him to follow out without a single backward glance what he believed to be the sound implications of an argument. "Chauncey's relation to Hamilton in those days," says his great friend Professor Gurney, "was in a way like that of a devout Christian to his Bible."[17]

It is in his review of Mill's *Examination of Sir William Hamilton's Philosophy* that we find the turning point of Wright's intellectual career.[18] The reviewer concedes Mill his whole case. But while going over to empiricism entirely, he takes pains to point out Mill's frequent misunderstand-

[16] Fiske, *op. cit.*, p. 85.
[17] *Letters*, p. 365.
[18] *Nation*, I (1865), No. 9, p. 278.

ings and misinterpretations of Hamilton's argument. Wright, like Spencer, appreciated the latent agnosticism in Hamilton's doctrine. From Hamilton he learned "the salutary lesson that the capacity of thought is not to be constituted into the measure of existence."[19] Metaphysical problems, while valid in the sense that they refer to something possibly real, refer to unattainable objects and are insoluble so far as human powers of comprehension can render the facts evident or even intelligible.

The effect of Mill's doctrine on Wright's thought was confirmed and deepened by Darwin's work on natural selection. Wright, quite in contrast to most of his generation, accepted Darwinism at once. When the *Origin of Species* appeared, it became the subject of special discussions at the Academy of Arts and Sciences. It was in following these discussions that Wright's views on natural selection took shape. In February, 1860, he writes that he has just finished reading the *Origin of Species* and has become a convert so far as he can judge of the matter.[20]

As Wright saturated himself in Mill and Darwin he grew more and more analytical, until, says Gurney,

> nothing was left standing in the mind that was not rooted in experience. Experience of phenomena gave both the content and the form of knowledge; the ground and the sanction of moral judgments; the limits of the universe in its intelligible, credible relations with man.[21]

From this time on his aversion to all forms of teleology grew more and more marked.

Darwin, then, reinforced and exemplified the viewpoint to which Wright had been brought by his studies of Mill: the problem of philosophy must be approached not by an a priori

[19] *Philosophical Discussions*, p. 94.
[20] *Letters*, p. 43.
[21] *Ibid.*, p. 370.

but by a properly scientific psychology.[22] Wright perceived that Mill's empiricism reinterpreted in the light of the idea of natural selection made our processes of thinking an essential part of the means by which we adapt ourselves to the natural environment.

II

From his study of Darwin Wright concluded:

The "that," the fact of evolution, may be regarded as established. The "how," the theory or explanation of it, is the problem immediately before us. Its solution will require many years of patient investigation, and much discussion may be anticipated, which will doubtless sometimes degenerate into acrimonious disputes, more especially in the immediate future, while what may be called the dialectics of the subject are being developed, and while the bearings and limits of views and questions are being determined, and conceptions and definitions and kinds of arguments appropriate to the discussion, are the subjects on which it is necessary to come to a common understanding.[23]

Wright considered himself primarily a contributor to this dialectics of the theory of evolution. All of his published work after 1860 is devoted to one phase or another of this problem.[24] His chief purpose was to keep clear the distinction between natural selection as a scientific hypothesis and the use of the idea of evolution as a metaphysical principle.

[22] The association psychology developed as an attempt to extend the methods of natural science, first of physics and later of chemistry, to the phenomena of mind. See Mill's statement "that a true psychology is the indispensable scientific basis of Morals, of Politics, and of the science and art of Education; . . ." *Examination of Sir Wm. Hamilton's Philosophy*, New York, 1884, I, 10-11.

[23] *Philosophical Discussions*, p. 169.

[24] When sending Darwin a copy of the proof sheets of his article on the "Genesis of Species," he wrote: "My special purpose has been to contribute to the theory by *placing* it in its proper relation to philosophical inquiries in general." *Letters*, p. 230.

Almost every one of Wright's papers published after 1860 is explicitly concerned with the theological aspect of the controversy regarding evolution. His animus against attempts to convert the results of natural science into a theology is the thread that binds together the scattered essays.

Wright's criticism starts from the precept of Bacon that "The human understanding is of its own nature prone to suppose the existence of more order and regularity in the world than it finds." The metaphysical and scientific types of thinking are, he thinks, initiated and controlled by fundamentally different sets of motives. The one is aroused primarily in defense of questioned sentiments, the other to satisfy intellectual or utilitarian inquisitiveness. "Philosophy passes like a judge upon its questions as if decision were quite as important as truth, whereas science feels no burden of proof in its judgments and is hostile to any finality in the present state of our knowledge."[25] The religious sentiments are essentially constructive. Men have a natural propensity to believe that will

> rarely allow the explanation of any important effect in nature to remain an open question. If observed or inferred physical causes do not suffice, invisible or even spiritual ones are invented; and thus the ground is preoccupied, and closed against the physical philosopher.[26]

Wright, says James, used to trace this confusion of moral and causal categories to Anaxagoras:

> The order we observe in things needs explanation only on the supposition of a preliminary or potential disorder; and this he pointed out is, as things actually *are* orderly, a gratuitous notion. Anaxagoras, who introduced into philosophy the notion of the νοῦς, also introduced with it that of

[25] *Letters*, p. 203.
[26] *Philosophical Discussions*, pp. 176-77.

antecedent chaos. But if there be no essential chaos, Mr. Wright used to say, an anti-chaotic νοῦς is superfluous.[27] Thus our moral and esthetic constructiveness turns all history into an epic and science into cosmology, "a fine composition of poetry under the forms of science."

The traditional arguments for design, derived from the structure of the inorganic world, the celestial framework, had been through the progress of astronomy and geology pretty well superseded by the middle of the nineteenth century. Here the hypothesis of development had triumphed. But the world of organic phenomena was still an unbridgeable gap in the chain of causation where finalism reigned. "That one animal or vegetable species ever was or could be evolved out of another seemed as much a dream as the transmutation of the chemical elements."[28] It was the controversy over evolution which awakened the theologians from their dogmatic slumber. The first phase of the controversy which had begun with the publication of Lyell's *Geology* paled into relative insignificance with the publication of Darwin's *Origin of Species*. Then for the first time the full consequences of this new derivative hypothesis were perceived. For the theologian it was a second Copernican revolution. If true, the derivative hypothesis completely demolished those arguments from evidences of design in the animal kingdom which under the influence of Paley had become an essential part of Protestant apologetics. The *Origin of Species,* says Professor Dewey, by destroying the last refuge of the notion of a fixed hierarchy of ideal types irresistibly implied that "Mind is within Nature and not a little God outside."

[27] James, *op. cit.*, pp. 24-25; *Philosophical Discussions*, p. 382.
[28] A. W. Benn, *History of English Rationalism*, London, New York, 1906, II, 160.

It broke up the categories of an age, introducing in their place "a mode of thinking that in the end was bound to transform the logic of knowledge and hence the treatment of morals, politics, and religion."[29]

But, as the philosophers had long known, the theory of evolution offers an easy alternative to the old fixed archetypal creation. It could be used as the keystone of a new natural theology by substituting for the notion of a static world order the idea of a process dynamic and progressive in character. In America the most popular and influential representative of this viewpoint was John Fiske. For the outlines of this new "Cosmism," as he called it, Fiske turned naturally to the synthetic philosophy of Herbert Spencer. But Spencer's doctrine of the unknowable was vague and indefinite as a foundation for the new religion of progress. "To those who sought design and purpose in the universe," remarks Professor Riley, "the Spencerian Unknowable was like the House of Lords, it did nothing in particular and did it very well." Discontented with this Spencerian vagueness, and although unable to perceive how personality and infinity could be compatible, Fiske proceeded to modify Spencer's system by construing the phenomenal universe as the manifestation of some definite power. The universe is not a mechanism but an organism with an indwelling principle of life. The problem of the relation between Darwinism and design was thus solved by postulating an immanent teleology in nature. In this way a descriptive hypothesis concerning the selection of variations in animal species was transformed into a moving principle of the cosmos, whose chief object it appeared was the production of human beings. "And striving to be man, the worm mounts through all the spires of form."

[29] Dewey, *op. cit.*, p. 2.

III

Wright, an intimate friend of Fiske, clearly perceived that Spencer, the professed philosopher of science, was the fountainhead of a new perversion of scientific facts to fit the Procrustean forms of theological dogma, that he was, in effect, interpreting nature in terms of a teleological principle which fulfilled substantially the same office as Hegel's *Geist*.[30] In his essay on "The Philosophy of Herbert Spencer" (1865) Wright points out that ostensibly the origin of the idea of evolution with Mr. Spencer was the investigation of physiologists in embryology from Harvey down to the present time; but

> while this is the obstensible origin and scientific value of this idea, its real origin is a very curious and instructive fact in human nature. Progress is a grand idea,—Universal Progress is a still grander idea. It strikes the keynote of modern civilization. Moral idealism is the religion of our times. What the ideas God, the One and the All, the Infinite First Cause, were to an earlier civilization, such are Progress and Universal Progress to the modern world,—a reflex of its moral ideas and feelings, and not a tradition.[31]

Wright admits that Spencer aimed to free the law of evolution from all teleological implications and to add such elements and limitations to its definition as should make it universally applicable to the movement of nature. "But teleology is a subtle poison and lurks where least suspected." All cosmological systems he insists are essentially teleological: "a fine composition of poetry under the forms of science." Wright repeatedly returns to Spencer's synthetic philosophy as an especially good illustration of this contention; his per-

[30] John Fiske, *op. cit.*, p. 87. "In the first and last of my many conversations with Mr. Wright—in July, 1862 and in July, 1875—I found myself charged with the defence of Mr. Spencer's philosophy."
[31] *Philosophical Discussions*, p. 69.

sistent hostility to it appears in his first published paper and is still referred to in the last essay that he wrote. He shows in detail that Spencer's system is un-Baconian and unscientific, not based on inductive inquiry, but on undemonstrated belief, assumed to be axiomatic and irresistible. The scientific theory of evolution, which is a hypothesis only, and bears no necessary relation to any particular system of philosophy, has but a faint resemblance to the Spencerian doctrine. The latter is "not a theorem of inductive science, but a necessary truth deduced from axioms."[32] Spencer's evolutionism is, therefore, dialectical, not inductive in character. The encyclopedia of popularized scientific facts which he compiled were "illustrations" of his metaphysical thesis, not inductive evidences for the operation of a natural law. Spencer's leading idea is too weak to sustain its load. This method of "encyclopaedic abstractions" is not the method by which the facts and theories of science have been established.

Moreover Spencer's summary of science treats science as finished and therefore certain. His method

> a positivist would regard as correct only on the supposition that the materials of truth have all been collected, and that the research of science is no longer for the enlargement of our experience or for the informing of the mind. Until these conditions be realized, the positivist regards such attempts as Mr. Spencer's as not only faulty, but positively pernicious and misleading. Nothing justifies the development of abstract principles in science, but their utility in enlarging our concrete knowledge of nature.[33]

Spencer commits the same fault as the ancient philosophers of nature, that of attempting to account for the uni-

[32] *Ibid.*, p. 401.
[33] *Ibid.*, pp. 55-56.

verse in its totality as having an intelligible order, a relation of beginning and end, a development.

If we must have a cosmology [Wright concludes], if we cannot restrain our speculative faculties to a less ambitious exercise, then that theory of the universe in its totality which agrees best with the facts of science and the ideas with which science has familiarized instructed minds in modern times is the one most likely to gain credence. But science itself stands in no need of such illumination.[34]

In criticizing Spencer's attempt to generalize from the nebular hypothesis to an evolutionary cosmology, Wright suggests an alternative that he calls "cosmic weather." A theory is needed which assimilates the causes which produced the solar system more nearly to the character of ordinary natural operations than the nebular hypothesis does. This alternative conception of natural processes, which he attributes to Aristotle, would banish cosmology from the realm of scientific inquiry. I quote Wright's statement of the theory:

With a view to such assimilation, and in opposition to "the theory of evolution" as a generalization from the phenomena of growth, we will now propose another generalization, which we cannot but regard as better founded in the laws of nature. We may call it the principle of *counter-movements*,— a principle in accordance with which there is no action in nature to which there is not some counter-action, and no production in nature from which in infinite ages there can result an infinite product. In biological phenomena this principle is familiarly illustrated by the counterplay of the forces of life and death, of nutrition and waste, of growth and degeneration, and of similar opposite effects. In geology the movements of the materials of the earth's crust through the counteractions of the forces by which the strata are

[34] "Spencer's Biology," *Nation*, II (1866), 724-25.

elevated and denuded, depressed and deposited, ground to mud or hardened to rock, are all of the compensative sort; and the movements of the gaseous and liquid oceans which surround the earth manifest still more markedly the principle of counter-movements in the familiar phenomena of the weather.

Of what we may call cosmical weather, in the interstellar spaces, little is known. Of the general cosmical effects of the opposing actions of heat and gravitation, the great dispersive and concentrative principles of the universe, we can at present only form vague conjectures; but that these two principles are the agents of vast counter-movements in the formation and destruction of systems of worlds, always operative in never ending cycles and in infinite time, seems to us to be by far the most rational supposition we can form concerning the matter.[35]

IV

In a group of reviews published from 1870 to 1873 Wright answers specific objections brought against the derivative hypothesis by such authors as Mivart and A. R. Wallace.[36] Wallace's difficulties are typical. Though a co-author of the hypothesis, he argued in his essay, *The Limits of Natural Selection as Applied to Man,* that among the most conspicuous examples of its failure to explain the whole order of nature are the more prominent and characteristic distinctions of the human race. Wright's characterization of this attitude is as follows: "In this essay Mr. Wallace seems to us to have laid aside his usual scientific caution and acuteness, and to have devoted his powers to the service of that superstitious reverence for human nature which, not content with prizing at their worth the actual qualities and

[35] *Philosophical Discussions,* pp. 9-10.

[36] "The Limits of Natural Selection as Applied to Man," in *Contributions to the Theory of Natural Selection* (1870); *The Genesis of Species* (1871); *Evolution by Natural Selection* (1872).

acquisitions of humanity, desires to entrench them with a deep and metaphysical line of demarcation.''[37]

The fruit of his indignation was a long composition, the only piece of sustained construction he ever attempted, entitled, *The Evolution of Consciousness.* Much of this essay is a repetition of arguments against natural theology and ''metaphysics'' which we have already noticed; and the whole is too long, and in some parts too obscure, to admit of adequate summary. I will attempt, however, to indicate the main point of his discussion.

The grain of truth in the contention that certain human characters and traits, e.g., brain power, language, moral discernment, volition, and self-consciousness cannot be accounted for by the agency of natural selection is that evolution is not merely a continuous development of certain kinds of powers and functions, but admits of novelty, by the emergence of new *uses* for existing powers. These new uses are related to the existing powers only as accidents. Thus an original power of locomotion may be used in divers ways, as crawling, walking, swimming, etc.; again, one organ may have different potential uses, e.g., the voice may be used as an organ of emotional expression or of communication, the hands for gesturing, manipulation, etc.; or one use may be common to different organs, e.g., lungs and gills. It is evident that genuinely novel powers, involved potentially in present

[37] Wright's criticism of Wallace's ''Contributions to the Theory of Natural Selection'' which appeared in the *North American* for October, 1870, was favorably commented upon and several times cited by Darwin in his *Descent of Man.* This encouraged Wright to send Darwin the proof sheets of his article on the ''Genesis of Species'' (*North American,* July, 1871), a defense of the hypothesis of natural selection against Mivart's criticism so cogent that Darwin replied with a letter of the warmest praise and a request that he be allowed to reprint and circulate the article in England as a pamphlet. This was the beginning of a correspondence between Darwin and Wright which lasted up to the final year of the latter's life.

uses and organs, can and do emerge in the course of evolution. The powers of flight for example were involved only potentially in previous phenomena. Similarly self-consciousness may have been involved potentially in preëxisting powers or causes.[38] This view of the origin of self-consciousness is by no means necessarily implied in the much more certain and clearly apparent agency of natural selection in the process of development. For the hypothesis of natural selection is not essentially concerned in the first production of any form, structure, power or habit, but only in perpetuating and improving those which have arisen from any cause whatever. The origin of that which through service to life has been preserved, is to this process arbitrary; in the logical sense of the word, accidental.[39]

Self-consciousness then could have arisen as an adaptation of existing powers to new uses. The existing powers in this case are memory and imagination.[40] Through them an image or gesture may act as a sign.

When a thought, or an outward expression acts in an animal's mind or in a man's, in the capacity of a sign, it carries forward the movements of a train, and directs attention away from itself to what it signifies or suggests; and consciousness is concentrated on the latter. But being sufficiently vivid in itself to engage distinct attention, it determines a new kind of action, and a new faculty of observation, of which the cerebral hemispheres appear to be the organs. From the action of these, in their more essential powers in memory and imagination, the objects or materials of reflection are also derived. Reflection would thus be, not what most metaphysicians appear to regard it, a fundamen-

[38] *Philosophical Discussions,* pp. 200-01.

[39] *Ibid.,* p. 252.

[40] It should perhaps be pointed out that Wright's whole argument is based on the associationist conception of mental processes. He agrees with, and would like greatly to extend, Bain's attempt to correlate mental with physiological processes.

tally new faculty in man, as elementary and primordial as memory itself, or the power of abstractive attention, or the function of signs and representative images in generalization; but it would be determined in its contrasts with other mental faculties by the nature of its objects. On its subjective side it would be composed of the same mental faculties—namely, memory, attention, abstraction—as those which are employed in the primary use of the senses. It would be engaged upon what these senses have furnished to memory; but would act as independently of any orders of grouping and succession presented by them, as the several senses themselves do of one another. To this extent, reflection is a distinct faculty, and though, perhaps, not peculiar to man, is in him so prominent and marked in its effects on the development of the individual mind, that it may be regarded as his most essential and elementary mental distinction in kind. For differences of degrees in causes may make differences of kinds in effects.

The motive to this peculiar concentration upon thoughts as signs "would spring," Wright adds, "from the social nature of the animal, from the uses of a mental communication between the members of a community, and from the desire to communicate which these uses would create."[41]

Having established, as he believes, the possibility of the natural genesis of self-consciousness in some such way as this, Wright goes on to formulate as the immediate implication a doctrine interestingly akin to what James later called "pure experience." "The distinction of subject and object becomes thus a classification through observation and analysis instead of the intuitive distinction it is supposed to be by most metaphysicians."[42] Immediately, or without attribution,

Subject and object are undistinguished in consciousness. Thus, the sensations of sound and color and taste and pleas-

[41] *Ibid.*, pp. 216-17.
[42] *Ibid.*, p. 219.

ure and pain, and the emotions of hope and fear and love and hate, *if not yet referred to their causes, or even classified as sensations and emotions,* belong to neither world exclusively. But so far as any man can remember, no such unattributed or unclassified states of consciousness are experienced. He cannot say, however, that they cannot exist, or . . . that a state of consciousness cannot be wrongly attributed or classified.[43]

[43] *Ibid.,* p. 231.

This conception of a "neutral stuff" of experience was implicit in the ordinary empirical theory, as given for example by J. S. Mill in Chaps. XI and XII of his *Examination.* The "critical" empiricists, John Grote, S. H. Hodgson and Ch. B. Renouvier all developed theories analogous to that of Wright. For Grote the distinctions of subject and object, mind and things, like all other determinations, arise by way of what he calls "notice" of the "immediacy of experience." Concrete experience prior to analysis is given as a unity, and it is the function of reflection to distinguish what is given in "immediacy" or experience. Subjective and objective are *in esse* two united though distinguishable aspects of our experience (*Exploratio Philosophica,* I, 22-23, 47-48, 59). Hodgson formulates a similar conception. Every experience has two distinguishable aspects: it is something given, a datum, a *that;* and a quality or nature, a *what.* In the experience itself in its simplest form these two aspects are not discriminated. When, however, they are distinguished as a definite somewhat experienc*ed* from a specific mode of experienc*ing,* they become the "experiential basis and foundation" for the distinction of subject and object. Thus, this distinction appears on a certain level of reflection within the field of consciousness (*Metaphysic of Experience,* London, 1898, Vol. I, Book I, Chaps. V-VII). Again Renouvier uses the terms *representatif* and *représenté* to denote the two distinguishable but inseparable aspects of the *représentation* from which the conceptions of *moi* and *non-moi* are evolved (*Traité de logique générale,* Paris, 1912, I, Secs. 3, 4). James was of course familiar with and indebted to each of these thinkers. Dewey's *Essays in Experimental Logic* (Chicago, 1916), are written from the same standpoint, which is the natural basis for a genetic and instrumentalist logic. Thus in a note (p. 136) he says: "This is but to say that . . . the presentation of objects as specifically different things in experience is the work of reflection, and that the discrimination of something experienc*ed* from modes of experienc*ing* is also the work of reflection. The latter statement, is, of course, but a particular case of the first; for an act of experiencing is one object, among others, which may be discriminated out of the original experience. When so discriminated, it has exactly the same existential status as any other discriminated object; seeing and thing seen stand on the same level

Thus, in the crucial case of sensation, the place we assign it is determined by a great variety of sensations and active forms of consciousness experienced in the localization of the object to which it is referred. It is only by the association (either spontaneous and instinctive, or acquired) of this sensation with those sensations and actions that are involved in the localization of the object, that we arrive at any notion of its locality. If we do not form any such associations of it with otherwise determined localities, and if it and its kind remain after much experience unlocalized, or only vaguely localized in our bodies, it is then, but *not till then,* referred to the conscious self as a subjective phenomenon. . . . Instead of being, as the theories of idealism hold, first known as a phenomenon of the subject *ego,* or as an effect upon us of an hypothetical outward world, its first unattributed condition would be, by our view, one of neutrality between the two worlds.[44]

V

It has been pointed out by Professor Dewey in an authoritative essay that pragmatism is an extension of historical empiricism with this fundamental difference, that it does not insist upon antecedent phenomena, but upon consequent phenomena, not upon the precedents, but upon the possibilities of action, and this change of point of view is almost revolutionary in its consequences. An empiricism which is content with repeating facts already past has no place for possibility and for liberty. It cannot find room for general conceptions or ideas, at least no more than to consider them as summaries or records. But when we take the point of view of pragmatism we see that general ideas have a very different rôle to play than that of

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of existentiality. But primary experience is innocent of the discrimination of the *what* experienced and the *how,* or mode, of experiencing. We are not in it aware of the seeing, nor yet of objects *as* something seen. Any experience in all of its non-reflective phases is innocent of any discrimination of subject and object.''

[44] *Ibid.,* pp. 233-34.

repeating and registering past experiences. They are the bases for organizing future observations and experiences.[45]

Now Wright, who was deeply indoctrinated with the Baconian emphasis upon the practical character of science, who possessed what Peirce calls "the laboratory habit of mind," noticed an aspect in the methodological procedure of both Newton and Darwin which Mill's analysis of the logic of science tends to obscure. This was that scientific laws are not merely descriptive of *proved* fact, but are essentially instruments enabling us to discover *new* facts. The point is constantly implied in his writings. Thus, to take only one instance, in the essay on Spencer (1865) he says:

The value of scientific theories whatever their origin can only be tested by an appeal to sensible experience, by deductions from them of consequences which we can confirm by the undoubted testimony of the senses. Thus, while ideal or transcendental elements are admitted into scientific researches, though in themselves insusceptible of simple verification, they must still show credentials from the senses, either by affording from themselves *consequences capable of sensuous verification,* or *by yielding such consequences in conjunction with ideas which by themselves are verifiable.*"[46]

A few pages later we find him asserting that

modern science finds in the requirements of the material arts the safest guide to exact knowledge. A theory which is utilized receives the highest possible certificate of truth. Navigation by the aid of astronomical tables, the magnetic telegraph, the innumerable utilities of mechanical and chemical science, are constant and perfect tests of scientific theories, and afford the standard of certitude, which science has been able to apply so extensively in its interpretations of natural phenomena.[47]

[45] "The Development of American Pragmatism," in *Studies in the History of Ideas,* New York, 1925, II, 351-77.
[46] *Philosophical Discussions,* p. 47. (The italics are Wright's.)
[47] *Ibid.,* p. 51.

And finally, consider, still from the same essay, the following:

> Nothing justifies the development of abstract principles in science but their utility in enlarging our concrete knowledge of nature. The ideas on which mathematical Mechanics and the Calculus are founded, the morphological ideas of Natural History, and the theories of Chemistry are such working ideas,—finders, not merely summaries of truth.[48]

These quotations are, I submit, sufficiently indicative that Wright was leading toward a pragmatic conception of experience. We may agree with Professor Cohen that "This conception of the experimental scientist as translating general propositions into prescriptions for attaining new experimental truths, is the starting point of Peirce's pragmatism." We may even further agree with him and Professor Perry that Wright's hypothesis of cosmic weather involves a conception of the relation between law and accident that is reflected in the tychism of Peirce and James.[49] Finally I have pointed out above that in his account of *The Evolution of Consciousness* Wright develops an idea suggestive of James's concept of "pure experience." However, Wright never explicitly formulated and developed these doctrines. The influence is real and obvious. But it can easily be exaggerated.

In the first place, outside of his obituary article in the *Nation,* I find but five casual references to Wright in James: he is mentioned once in the *Letters* (II, 233); a general indebtedness is acknowledged in the Preface to the *Principles of Psychology* (I, vii); the conception of cosmic weather is alluded to in the *The Will to Believe* (page 52) and in *Pragmatism* (page 105); and he is cited as an example of tough-minded empiricism in the *Pragmatism* (page 263).

[48] *Ibid.*, p. 56.

[49] Peirce, *op. cit.*, pp. xix-xx. Ralph Barton Perry, *Annotated Bibliography of the Writings of William James,* New York, 1920, p. 5.

James, who was always over-generous in giving credit, would surely, as Mr. Henry James has pointed out (*Letters,* I, 152, note), have acknowledged a greater indebtedness to Wright had he believed it to exist. Moreover, in his essay on Wright, James speaks of him as an exponent of the classical empiricism rather than as sharing his own point of view:

> In philosophy he was a worker on the path opened by Hume, and a treatise on psychology written by him . . . would probably have been the last and most accomplished utterance of what he liked to call the British School. He would have brought the work of Mill and Bain for the present to a conclusion.[50]

Peirce, so far as I am aware, does not mention Wright in any of the articles he published. But a letter to Mrs. Ladd Franklin and a recently printed fragment throw a good deal of light on the historical origins of pragmatism. I will quote first from the letter:

> It must have been about 1857 when I first made the acquaintance of Chauncey Wright, a mind about on the level of J. S. Mill. He was a thorough mathematician. . . . He had a most penetrating intellect. . . . He and I used to have long and very lively and close disputations lasting two or three hours daily for many years. In the sixties I started a little club called *The Metaphysical Club*—Wright was the strongest member and probably I was next. Nicholas St. John Green was a marvelously strong intelligence. Then there were Frank Abbott, William James and others. It was there that the name and the doctrine of pragmatism saw the light.
>
> There was in particular one paper of mine that was much admired and the ms. went around to different members who wished to go over it more closely than they could do in hearing it read. . . . I patched up the piece I speak of . . . and it appeared in November, 1877.[51]

[50] James, *op. cit.,* p. 22.
[51] *Journal of Philosophy,* XIII (1916), 719.

The recently published fragment on the founding of pragmatism is even more interesting:

It was in the earliest seventies that a knot of us young men in Old Cambridge, calling ourselves, half-ironically, half-defiantly, "The Metaphysical Club"—for agnosticism was then riding its high horse, and was frowning superbly upon all metaphysics—used to meet, sometimes in my study, sometimes in that of William James. It may be that some of our old-time confederates would today not care to have wild-oats-sowings made public, though there was nothing but boiled oats, milk, and sugar in the mess. Mr. Justice Holmes, however, will not, I believe, take it ill that we are proud to remember his membership; nor will Joseph Warner, Esq. Nicholas St. Green was one of the most interested fellows, a skillful lawyer and a learned one, a disciple of Jeremy Bentham. His extraordinary power of disrobing warm and breathing truth of the draperies of long worn formulas, was what attracted attention to him everywhere. In particular, he often urged the importance of applying Bain's definition of belief, as "that upon which a man is prepared to act." From this definition, pragmatism is scarce more than a corollary; so that I am disposed to think of him as the grandfather of pragmatism. Chauncey Wright, something of a philosophical celebrity in those days, was never absent from our meetings. I was about to call him our *corypheus;* but he will better be described as our boxing-master whom we—and I particularly —used to face to be severely pummelled. He had abandoned a former attachment to Hamiltonianism to take up with the doctrines of Mill, to which and to its cognate agnosticism he was trying to weld the really incongruous ideas of Darwin. John Fiske, and, more rarely, Francis Ellingwood Abbott, were sometimes present, lending their countenances to the spirit of our endeavors, while holding aloof from any assent to their success. Wright, James, and I were men of science, rather scrutinizing the doctrines of the metaphysicians on their scientific side than regarding them as very momentous spiritually. The type of our thought was decidedly British. I, alone, of our number, had come upon the threshing-floor of

philosophy through the doorway of Kant, and even my ideas were acquiring the English accent.

Our metaphysical proceedings had all been in winged words (and swift ones, at that, for the most part), until at length, lest the club should be dissolved, without leaving any material *souvenir* behind, I drew up a little paper expressing some of the opinions that I had been urging all along under the name of pragmatism. This paper was received with such unlooked for kindness, that I was encouraged, some half dozen years later, on the invitation of the great publisher, Mr. W. H. Appleton, to insert it, somewhat expanded, in the *Popular Science Monthly* for November, 1877, and January, 1878.[52]

From this evidence taken *en ensemble* we are, I believe, obliged to conclude that while the germs of a pragmatic theory of knowledge, of a tychistic conception of nature, and even of a theory of pure experience are to be found in Wright, neither Peirce nor James were aware of a particular indebtedness to him for any of these ideas. In truth they were both inveterate cosmologists, and, while they shared with Wright the empirical approach to philosophical problems, both were, as Peirce says, striving to free themselves from the agnosticism "then riding its high horse" that Wright represented. At the time of his greatest intimacy with Wright, James breaks out in a letter:

> I'm swamped in an empirical philosophy. I feel that we are nature through and through, that we are wholly conditioned, that not a wiggle of our will happens save as the result of physical laws; and yet, notwithstanding, we are *en rapport* with reason.—How to conceive it? Who knows? . . . We shall see, damn it, we shall see![53]

[52] *Hound and Horn*, II (1929), 283-85.

[53] *Letters*, I, 152-53.

Professor G. H. Palmer in his contribution to the *History of the Development of Harvard University*, 1869-1929 (p. 8), says that James, who grew up believing the powers of his father to have been hindered in efficiency, if not in growth, by a mystical idealism, turned at first

Peirce is equally vehement in his dissatisfaction with this sort of positivism. Years later he characterized the period as follows:

> Mechanism was now known to be all, or very nearly so. All this time, utilitarianism,—that improved substitute for the Gospel,—was in its fullest feather; and was a natural ally of an individualistic theory. Dean Mansell's injudicious advocacy had led to mutiny among the bondsmen of Sir William Hamilton, and the nominalism of Mill had profited accordingly; and although the real science that Darwin was leading men to was sure some day to give a death-blow to the sham-science of Mill, yet there were several elements of the Darwinian theory which were sure to charm the followers of Mill.[54]

It is this sort of philosophy that Wright undeniably represented to the minds of Peirce and James. On the other hand what they came ultimately to stand for would have been equally abhorrent to him: James's frank anthropomorphism, his vision of a promethean God striving to weld order out of chaos and Peirce's conception of evolution as proceeding according to the gospel of Saint John would have aroused the *furor indignationis* in him more than any heresy of which Spencer or even Fiske was guilty. What Wright hated most was romantic cosmology in any form, and both James and Peirce were New England transcendentalists at the core.

Wright had the insight and ability, if not the industry, to have developed a pragmatic empiricism. From this exposition of his thought, an exposition in which I fear I have failed to do justice to the clarity and penetration of his ideas, I think it may certainly be concluded that he is a significant

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to Wright's hard empiricism as a welcome escape but that "by degrees its *avoidance of ultimate issues* and *restriction to mere fact* exasperated him" (Italics mine). Palmer quotes James as having once said to him, "Chauncey is the damndest rationalist that I ever saw!"

[54] Peirce, *op. cit.*, p. 278.

figure in the transition from the traditional empiricism to the radical or pragmatic empiricism of James, Peirce, and Dewey. But, if Wright had developed a pragmatic empiricism, his formulation of it would have remained literally faithful to the canons of scientific truth; it would have been akin rather to the serene naturalism of Dewey than to the cosmogonies of Peirce and James.

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